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PRIMARIES**

**The Last Days of Radio Impacto
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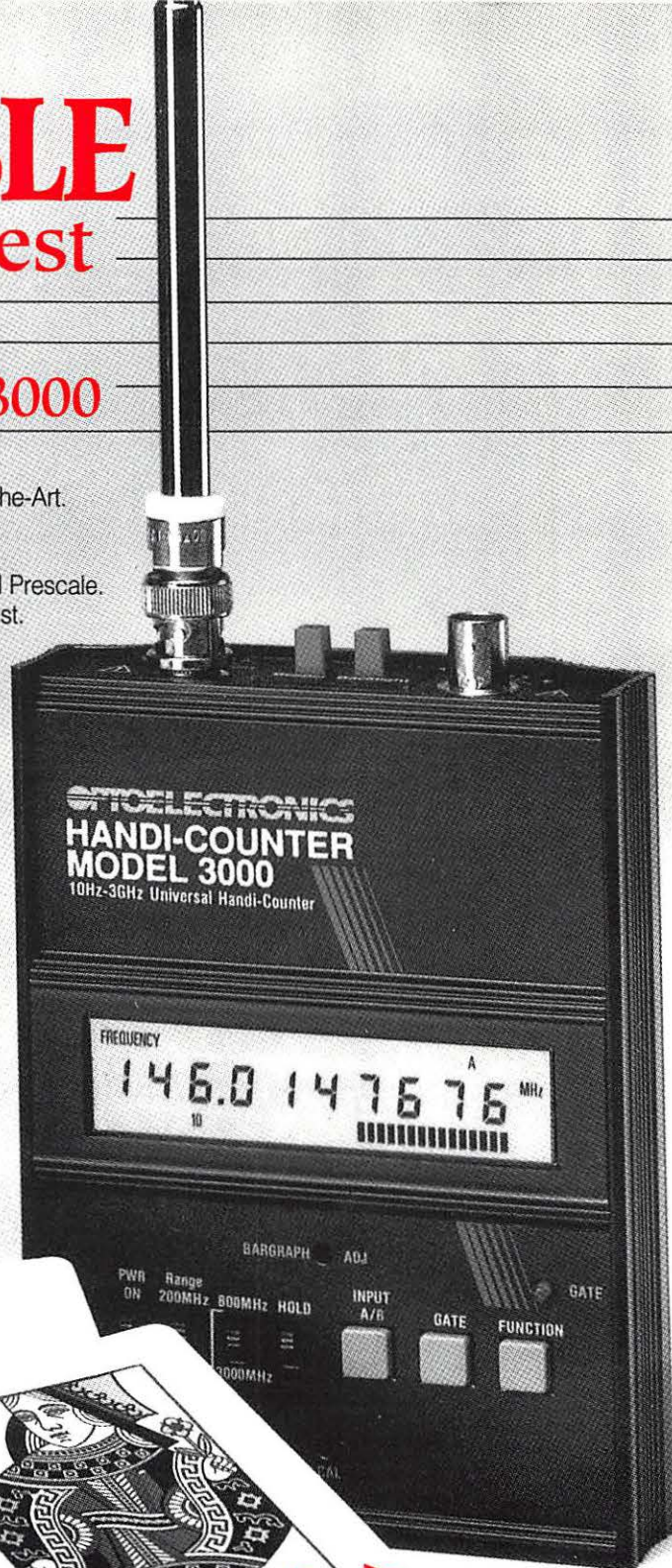
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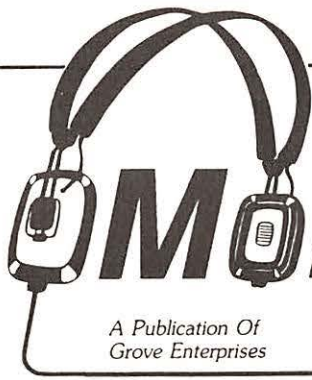
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Monitoring Times



Cheryl Day Anderson

Gentlemen, Start Your Scanners

by David Mercer

8

February begins the season for auto racing. It is also the start of some excellent scanner monitoring opportunities. Following the behind-the-scenes action has become almost as popular a sport as racing itself. Mercer's article helps you get an informed start on your racing season.

The Last Days of Radio Impacto

by Don Moore

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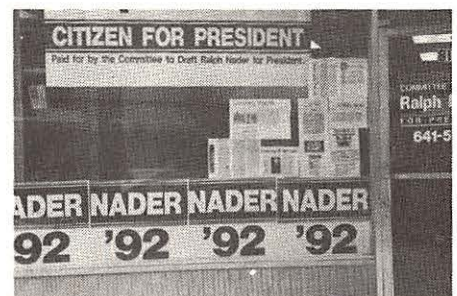
For seven years, Radio Impacto was one of the strongest Latin American stations — and one of the most controversial. Though based in Costa Rica, its rumored links with the CIA and the Nicaraguan Contras kept the station a provocative mystery. In the summer of 1990, Don Moore visited the station a few weeks before it shut down operations.

The Presidential Primary Follies

by Everett Slosman

18

If you can't avoid 'em, at least they can provide some entertainment, says Slosman of the omnipresent presidential candidates who dominate the media every four years. Plan your own campaign by brushing up on frequency lists and listening strategies for the day the presidential primaries invade your neighborhood.



Everett Slosman

Cover Photo: Nearburg Racing's Toyota Formula Atlantic race car.
Photo by Cheryl Day Anderson.

Radio Polonia Reaches the World

by Larry Miller

22

This timely look back at Radio Polonia's 65-year history acknowledges the influence of a station once so strong it was forced to reduce power by half to avoid interference with other Europeans. By the time you read this, the station may be transformed into a public (instead of government) radio station and renamed Polish Radio Warsaw.

Scrounge CB

by Benjamin Meyer

24

Those were the days when solid state, microprocessors and selectivity were non-existent, but to a teenager just getting on the air, it was pure adventure.

A DXcellent Adventure

by Karl Zuk

26

In an expanded "American Bandscan" column, author Zuk takes us on a legendary DXpedition to Newfoundland with three hardy and talented DXperts.

And More ...

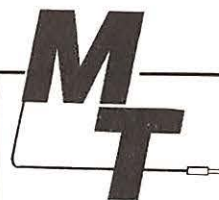
"Computers and Radio" and "Experimenters Workshop" both scratch the surface of the computer to radio interface. To understand this fascinating, complicated, but vital aspect of computer-controlled radio, get in on the ground floor of what will no doubt be an on-going discussion.

Lots of practical advice is yours this month from choosing coax ("Scanning Report") to apartment antennas ("Beginner's Corner") to how to use aero charts and maps ("Plane Talk"). Picking out a new receiver? "Scanner Equipment" clarifies what all those specs listed on the box mean, anyway.

There's lots, lots more, so open up the pages and let's get started!

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LETTERS

Watching the struggles of newborn democracies from this side of the ocean, I was struck by an observation made by former Secretary of State Dean Rusk: Democracy does not thrive in an atmosphere of insecurity and hatred. I wonder: Has the attack on listener's rights in the U.S. come as a result of an increase in distrust and intolerance? Or more likely, has it come about as a result of persons abusing their democratic rights?

Lest we in the U.S. think we are better than those countries experiencing ethnic hatreds, Dan Unruh of Washington State sent in a news clipping from *The Daily Record* in Ellensburg. It reminds us that fifty years ago all residents of Japanese, German or Italian descent were ordered to turn in their cameras, transmitters, and shortwave radios.

Gary Laurenza of Ohio fears that irresponsible news media and fire and police chasers have contributed to the expensive systems installed by the police to "censor the airwaves." Gary was particularly incensed when reading in the *Cleveland Plain Dealer* about a new device in use in Wickliffe, Ohio, a suburb of Cleveland. Part of Lake County's new \$10.5 million radio system includes a device which, in addition to continually checking the system's 15 channels around-the-clock, emits an annoying tone which is audible only to non-system users.

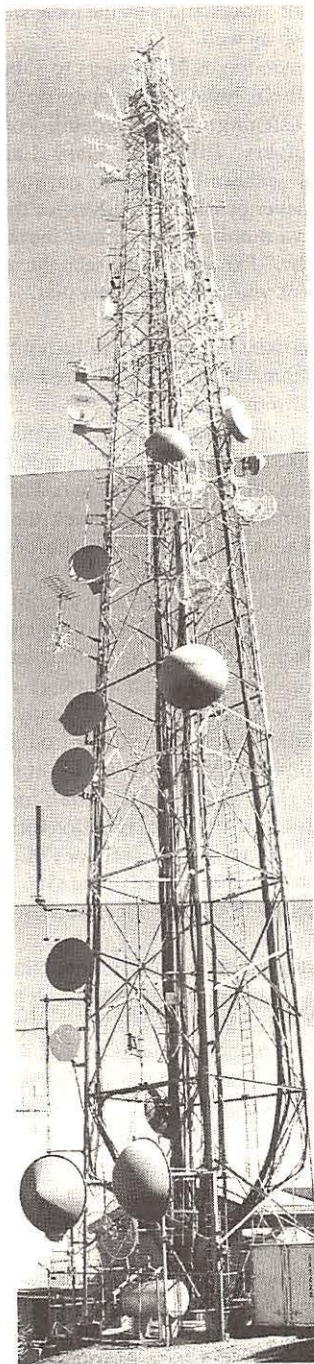
County officials admitted that not only did it prevent the criminal element from listening in to public safety communications, it also keeps the news media and the public from listening. But "We're not blocking anyone's freedom," said County Administrator Kenneth Gauntner.

Although Willoughby Police Chief William Crosier admitted that the tone does remove the public as a check and balance for the departments, he maintained, "I'd like to think the police and fire departments are professional and would not withhold information."

Yeah, right.

Remember the "Antenna Talk" column that told you how to identify the various antennas on a communications tower? (August 1991) Well, Eric Forslund of California is giving you a chance to practice your skills with this incredible three-part shot of a tower on Mt. Diablo, about 40 miles east of San Francisco. This is only one of several types of arrays on Mt. Diablo captured by Eric's great photography.

You've got to be joking! That's what Robert Reynolds of Oregon thought when he read last month's item on "Baby Speaks in



Morse Code." Let's put it this way... we did find this item in print, although the source (*Weekly World News*) hardly has the reputation of the *New York Times*! But we are sometimes guilty of looking at the lighter side of "journalism."

We also credit our readers with possessing the ability to read with a discerning eye, even what they read in *Monitoring Times*. One such reader—Harry Church of Illinois—points out, for example, that the illustrations on page 52 were pasted up incorrectly; the ferrite loop and

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box-form loops should be switched. Thanks, Harry; we try, but we're not infallible.

In other items we report the news as we heard it, and subsequent clarifications often arrive from our readers. Although we were correct in reporting in November that writer Chuck Robertson was arrested on drug charges, he writes that "the report of my death has been greatly exaggerated." According to Robertson, this case, as well as the 1988 arrest, was dismissed for lack of evidence.

MT is itself the subject of rumors from time to time; the latest one being that "Grove Publishing" has filed for bankruptcy. We couldn't find any record of such a company, so we called Grove Press, an erotic book publisher in New York. According to a spokesperson there, an attempt was made to sell their company nearly two years ago but they are still active. As for Grove Enterprises, publisher of *Monitoring Times* and other radio publications, we're doing just fine, thank you!

The mail always brings a variety of opinions on all kinds of subjects, and we love it! Here are several points of view regarding shortwave broadcasting:

James Snow of Kentucky comments on the 100 or more religious broadcasters and would like a listing ... as a guide to avoid them. (He thinks USB or LSB is the future of shortwave, by the way, and reports excellent reception of an American station which was broadcasting separate programming on each sideband.)

Fr. Lawrence Brey of Minnesota appreciated our December feature on Vatican Radio, but deplores its current trend in programming. He says, "As a frequent monitor of Vatican Radio, I note with dismay that its thrust today is largely humanistic and 'ecumenical,' and seasoned with worldly music and bongo drums sandwiched in between its orthodox logos."

A typo has Pope Pius XI holding an inordinately long tenure--from 1870 into the 1930's! Rather, as Fr. Brey points out, it was Pius IX who made himself "Prisoner of the Vatican" in 1870.

If the proposed "Radio Free Asia" makes it off the ground, reader Don Bice of Florida wonders which of China's 200 dialects it will choose to use for broadcasting to the mainland. *MT* correspondent Jeff Chanowitz attended the press conference in which the presidential task force made its recommendations; read his report in this month's "Communications" column.

Given the fact that almost all Americans can trace their ancestry back to some other country, Barry Diefenderfer of Florida cannot understand why shortwave listening is not more widely advertised. "I find it both interesting and bewildering," he says, "that shortwave manufacturers and retail outlets have not advertised the fact that you can listen to programs from the countries of their interest. If I owned Tandy or any other

outfit, I would have bought as much advertisement space as possible on CNN during the Gulf War. I do not understand why the local stores do not advertise as well."

Barry encourages *MT* readers to submit articles to their local newspaper describing shortwave listening and the availability of shortwave receivers. Likewise, Gary Laurenza encourages scanner listeners to put in a good word whenever possible "to advertise the positive things we monitors do to uphold the integrity of our hobby." I know, having seen the articles, that many of you have done just that.

Are you excited about your radio hobby? The following three writers are all fired up about their new discoveries.

James Tunnell, author of the excellent reference book, *Latest Intelligence*, couldn't wait to share with other scanner listeners a scanning aid discovered while helping track the recent Berkeley/Oakland Hills firestorm that destroyed 3,200 homes in the Bay area.

"If you're like me, you carry your handheld scanner from place to place and often are disappointed when signals fail to be loud and clear because you've moved out of range of your scanning receiver," says James. "Tandy Corporation [Radio Shack] has just introduced the Archer Amplified VHF/UHF/FM Portable Antenna (Cat. No. 15-1607) which retails for \$24.95 and is designed to improve reception for pocket-sized small-screen TV receivers or FM portable radios. The frequency range of the system operates between 50-900 MHz--ideal for most scanner users."

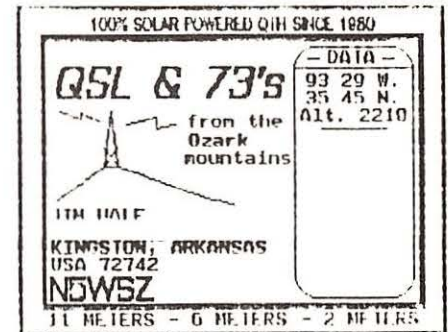
Since the antenna, which is about the size of a pack of playing cards, was not originally intended for scanners, you'll need to purchase couple of adapters for a total cost of about \$4, but the results will be worth it, claims James.

He found that extending the twin antennas to the right and left of the amplifier produces highly directional signal reception; in a side-by-side mode, the antennas respond like a high performance ground plane. In either mode, the device acted much like an expensive active antenna with no distortion or intermodulation.

Thanks, James, for the tip.

Another reader has been giving the local public school kids a taste of broadcasting. He erected a low-powered transmitter on the top of the school building and "As you can guess the students are really buzzing! We made our first broadcast, and kids were already asking, 'When will it be on 24 hours?' We are going to try to broadcast home basketball games and teach kids about radio stations while they think they are having fun!

"As I was playing the kids' tapes and doing intros and announcements with the microphone and mixer there was one red-headed kid hanging around a lot. According to my wife, he is the



'worst' problem child they have. Stay tuned and see if he gets interested in school and sticks around..."

Getting kids turned on to radio is something we always encourage. However, if you try the above experiment, be sure that your equipment complies with FCC Part 15 certification.

New amateur technician Jim Hale of Arkansas tells of the fun he's having on the air: "I woke up yesterday with an excited nervous feeling because I had time for one cup of brew before Mir would be passing over my state. I started giving my call and saying 'CQ Mir,' and after a couple tries a cosmonaut returned my call! It's kind of neat that Mir and I are both talking on solar energy. Mir will be passing over again today and this time will be a lot closer. I am looking for a Russian phrase book so I can talk to him in his language. A little bit anyway."

"10 watts into a 1/4 wave ground plane antenna to QSO Mir at a 499 km range--decent?"

Marshall Quade of South Carolina has been a licensed ham since 1975. But after picking up *Monitoring Times* at a hamfest three years ago, he says, "I now spend more time monitoring the shortwave bands than the ham bands."

Marshall uses a Yaesu FRG-7700 for his shortwave monitoring and wonders how he might improve it. "I feel sure somewhere in your magazine you have probably covered this."

Well, in November 1987 we covered one approach to frequency expansion, but "Frog" users have no doubt discovered other mods and tips over the years. Marshall is not the first to wonder if space might not be given to reviews of older equipment, modifications or repairs, and parts sources. "It might be called the 'Oldies but Goodies' column," is his suggestion. What do you think?

The days are beginning to lengthen, but several months of winter remain in the northern regions. Fortunately, radio hobbyists are one breed that never gets cabin fever; cold indoor days just mean better propagation and greater opportunity for more good monitoring times!

Rachel Baughn,
Editor

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Cellular Eavesdropper Sentenced

Robert Dunnington, the Virginia Beach, Virginia, restaurateur who illegally taped a 1988 cellular telephone call between then-Lt. Gov. L. Douglas Wilder and developer Daniel Hoffler, was sentenced in Norfolk to 30 days in a halfway house.

In addition, Dunnington will spend three years on probation and pay a \$5,000 fine. He could have been sentenced to five years in prison and fined \$250,000.

During the taped telephone conversation, Wilder referred to news articles about fellow Virginia democrat U.S. Senator Charles S. Robb. The articles alleged Robb's presence at parties where cocaine was used.

"It was the big mistake of my life," Dunnington told U.S. District Judge John A. MacKenzie. "I am sorry for it. It will not happen again."

Federal law prohibits the monitoring of cellular telephone calls.

"We Have You Surrounded..."

Pirate radio operators in Japan are apparently a very timid sort. According to the *W5YI Report*, the Japanese PTT (the equivalent of the FCC) has installed a 40 watt transmitter at their Tokyo and Osaka monitoring stations. When a pirate operator is heard, the PTT pushes a button and broadcasts a warning that the transmitter is illegal and that continued operation will be punished with a stiff fine.

According to the Japanese PTT, the RF scolding is very effective.

Radio Hoaxes: A Sinking Feeling

There seems to have been an outbreak of phoney maritime distress calls toward the end of last year. The FCC is investigating one bogus call that resulted in the deployment of a U.S. Coast Guard helicopter and ship under severe weather conditions.

Transmissions from a hoaxer indicated that a boat had run aground and was taking on water on a reef 20 miles due east of Duck, North Carolina. The FCC was able to tape the call and is looking for assistance in identifying what they feel was a transmitter in northern Virginia. If you have information on this event, call Cynthia Jeffries at 202-632-7240.

In another case, the Philadelphia office of the FCC identified a minor as responsible for transmitting distress signals to the Coast Guard over marine radio. Those transmissions were tracked to Hamilton Township, Mercer County, New Jersey.

Among the penalties faced by perpetrators of such hoaxes is a \$25,000 fine and up to 10 years in prison.

Double Ham!

The number of new ham radio operators, drawn to the hobby after the abolishment of the Morse Code requirement, continues to increase dramatically. According to the *W5YI Report*, figures released by the FCC show that 29,399 newcomers joined the ham ranks during the period April through October 1991. That's an average of 4,200 a month — more than 100% greater than the average of the prior four years.

The first codeless technician operator license was mailed on March 12th of last year.

Dayton Price Hike

If you're planning on attending the Dayton Hamfest this spring, better get your tickets now. While advanced general admission ticket prices will remain the same (\$10.50), tickets purchased at the door will cost \$1.00 more — \$14.00. Flea market spaces have also been increased by \$5.00 to \$30.00.

The Dayton Hamvention is held the last weekend in April in Dayton, Ohio.

Knowing a Winner When You See One

The Islamic News Agency of Iran and the Cuban News Agency Prensa Latina have

signed an agreement that provides for the exchange of newscasts. The agreement allows the two countries to "make use" of each others' material in their programs and to facilitate the activities of reporters from both countries.

Iran is the theocratic Muslim state that once held American diplomats hostage for 144 days. Cuba is the Caribbean nation best known for its shaky future as the world's last bastion of communism.

Just Makin' a Buck, Comrad

Beginning this year, Tass, the Russian news agency, is offering to sell you "full verbatim records of the most important news conferences, texts of the latest state documents, as well as other materials of special interest to you."

The official price per page is US\$1.50 in Russian or \$3.00 in English. Delivery is \$5.00. Tass, however, is apparently learning the ropes of capitalism quickly. They're willing to negotiate. "The final price," says the news agency, "can be settled upon agreement between the sides in each individual case."

For more information, call Mr. Yevstigneyev at 202-42-68. And tell them *Monitoring Times* sent you.

The KGB is also selling out to capitalism. According to *TV Watch* columnist Phil Kloer, TV producer Robert Halmi bought the TV rights to hundreds of declassified KGB files — about 36 big boxes full.

Mr. Halmi says he's not sure what he'll do with the files — anything from a series to a few movies is possible. The files contain information on Lee Harvey Oswald's time spent in the Soviet Union and the assassination of Leon Trotsky.

The Christian Thing to Do

Zambia's Ministry of Information and Continuing Education has lifted its ban on all Islamic radio programming. A ministry spokesman said the decision to lift the ban was made after complaints were received by the Muslim community. The

COMMUNICATIONS

New VOA Agenda Proposed

On December 16th at a press conference in Washington, D.C., the President's Task Force on International Broadcasting released a dramatic and far reaching report, which called for the restructuring of the Voice of America, the eventual elimination of Radio Liberty/Radio Free Europe and Radio Marti, and the creation of a new service beamed to China to be called Radio Free Asia.

Despite the ending of the Cold War, the panel concluded that "this is no time to abandon or degrade America's great international broadcasting endeavor." Instead, with the savings from the elimination of jamming by the former Soviet Union, the panel authorized the creation of Radio for Free Asia. The new service will transmit local news and music to China, much like RL/RFE broadcast to Eastern European countries today.

On the eve of its 50th anniversary, the panel also authorized an expanded role for the Voice of America. John Hughes, a former USIA director and the panel chairman, stated, "It's time for the VOA to truly cover the whole world...VOA must become a global service." The panel proposed that VOA should concentrate more of its resources on listeners in Africa, Asia, and Latin America. The new emphasis on the Third World will include the construction of additional transmitters and a review of the languages VOA broadcasts.

The panel also proposed the temporary continuance of Radio Marti, although within the organizational framework of VOA, and Radio Liberty/Radio Free Europe. Under the panel's proposals, once a country develops a strong democratic system, which includes a mature and free press, broadcasts by RL/RFE and Radio Marti will end.

In response to a question by MT's Jeff Chanowitz about the future of shortwave broadcasting, John Hughes, the task force chairman, offered DXers and SWLs good news. In his opinion, "Shortwave as a vehicle for the delivery of our message will certainly be with us into the next century."

While the report by the President's task force has clearly set the U.S. government's future role in international broadcasting on firm ground, the presence of budget deficits will not ensure immunity for U.S. government broadcasters from future budget cutting by Congress. Thus, with the taskforce proposals, SWLs can be guardedly optimistic about listening to VOA and other U.S. broadcasts for decades to come.

previous administration had banned Muslim radio programs "on the grounds that Zambia was a Christian country."

Help from Above

According to an article in the *New York Times*, a type of computerized compass using portable satellite technology has become the rage among boaters, recreational aviators, backpackers and other wayfarers. Growing in popularity since the 1980s, units ranged from \$2,000 to \$2,500. The Sony Corporation of America now offers a more moderately priced consumer version called Pyxis (the Latin word for a mariner's compass).

According to Sony, Pyxis uses signals transmitted from four Navstar satellites operated by the Defense Department. The hand-held receivers, which weigh about a pound, simultaneously track all four satellites to plot the user's geographical position on the basis of longitude, latitude and altitude. Pyxis uses four AA-size batteries for power.

Mr. Cricket Dies

John Arlott, known around the world for his play-by-play cricket commentary on the BBC, died at the age of 77. Prime Minister John Major, a fan of the national game, said in a tribute, "He was the very personification of cricket. To hear a John Arlott commentary was to be there. No one attained the excellence that he did in describing the game he loved."

Walt Henry, W6ZN, founder of Henry Radio, died recently due to complications caused by emphysema. Walt was 80 years old.

Credit where credit is due: Harry Baughn, North Carolina; Jeff Chanowitz, Maryland; Massey Eckey, New Jersey; R. Molinar, New Jersey; Bobby Thompson, Virginia; *The Reading Eagle*; *Richmond News Leader*; *World Broadcast Information*; and the *W5YI Report*. "Communications" is compiled by Larry Miller.

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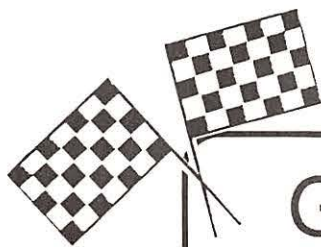
The scene is this: the last five laps of an auto race.

The driver in car number 36 is running in second place on the winding street course, a few hundred yards behind the leader, but not within sight. The leader is snaking his way to the finish.

The driver in 36 knows he has a shot at the leader, but he'll need to gun it all the way to do it, and his fuel is running low. No time for a pit stop. He thinks he can make a run at a win, but he isn't sure. Catch the leader and it will all be worth it; run out of gas within sight of the finish line and 36 goes home with nothing.

Suddenly the speaker in 36's helmet comes to life. The pit-crew chief tells him what he needs to know: the leader has spun off the track and out of the race. Only now does 36 know the win can be his without risking his fuel situation.

"Okay, chief, this one's ours!"



Gentlemen: Start Your Scanners

by David Mercer

Pick any race, any course and virtually any kind of car beyond the purely local level, and this scene is played out weekend after weekend in racing season, all within the listening reach of a scanner owner.

In the old days, the crew chief's only communication with a driver was via handheld chalkboard. Wait until the driver is in sight, then scrawl the message and hold it up for the driver to see. As for the driver himself, the only communication with his pit crew came after entering the pits.

The old days are gone.

Now professional racers stock their cars and their pit positions with Uniden, Motorola, Kenwood, and others. The listening at the race can be exciting or mundane, but one thing is guaranteed — it will be omni-present.

Communication within a racing team — between drivers and pit crews — makes for some of the more interesting listening. Situations like the above, routine calls to the pit to prepare for a driver's pit stop, information on the position of other drivers, course conditions, position of wrecks, and directives from race officials are just a handful of what can be heard.

But the chatter isn't limited to just the actual racing teams. The sanctioning body at a race — CART, IMSA, NASCAR, SCCA, etc. — maintains contact between the race director, the track control booth, race steward stations (various points around the track which report wrecks, collisions, and poor track conditions), and emergency services personnel.

The variety of what there is to hear can be almost overwhelming, and very interesting to the race fan. The proliferation of low-cost, handheld scanners puts all of this in ear-shot of the listener.

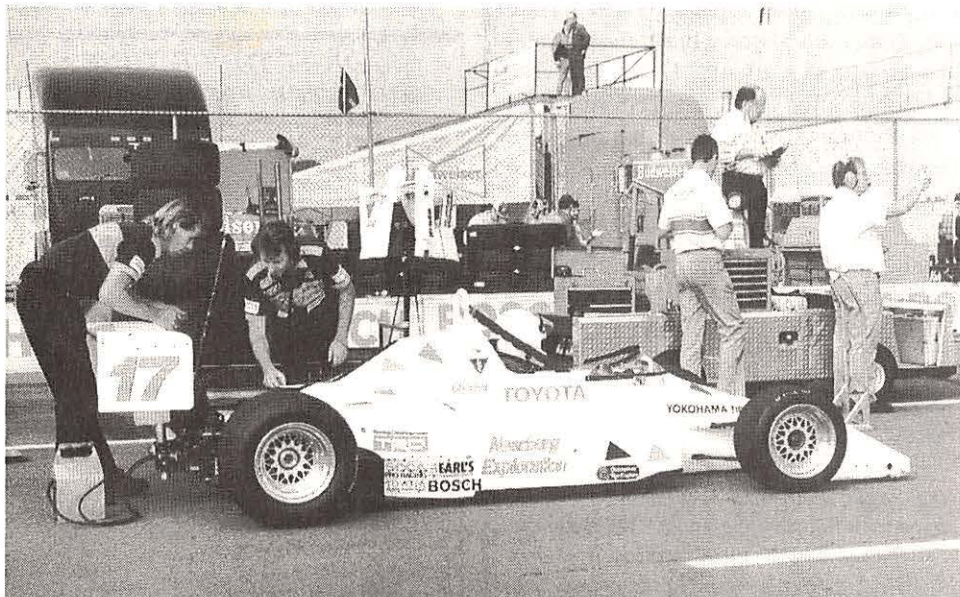
The number of scanner-toting race fans has increased dramatically in recent years in proportion to their increased use by the racing teams and sanctioning bodies themselves. Some businesses now specialize in scanner frequency services for auto racing as well as specialty equipment for use under noisy track conditions.

In many ways, it puts the racing fan on the inside, in close contact with his favorite driver. The average fan is now in a position to know what really happened on the back stretch or in turn 12 before it ever goes to press.

Some teams, like Archer Brothers Racing, use scramblers keeping on-track conversations private, but most teams speak for all the world to hear.

"You plan a lot of pit strategy," said John Anderson of King Motorsports. "You might be talking in code among the crew, slang words you develop among the team."

Among the bigger teams, one of the objectives is to keep the chatter to a minimum due to the number of people who can be on the channel at any given time.



Cheryl Day Anderson

Two-way communication for the pit crews, drivers, and the race organizers has become an almost indispensable part of the sport of auto racing.

"Our set-up is such that we run a team of four cars, and we can talk back and forth," said Tommy Archer of Archer Brothers.

Add four drivers, plus a crew chief (the crew members generally have only listening capabilities, at most) and the confusion can mount.

"You don't want too many people talking," said Ron Swain of Rocketsport Racing. "It's best that your crew chief handle (pit communications)."

The typical team communications network consists of a base-unit in each car, a base-unit in the pit area, and handheld or belt-mounted transceivers with the pit crew chief and usually the team manager. Pit crew members generally have a belt-mounted receiver. In shorter races some teams will use handheld transceivers in the cars as well.

The drivers have the speakers and microphone mounted within the helmet, with the push-to-talk button (which switches the transceiver from receive to transmit mode) mounted on the steering wheel, or on the dash of the car. The steering-mount is becoming the favorite option, allowing the driver access without reaching for the dash.

The transceiver itself is mounted below the dash to the driver's right or in the rear of the car, with the antenna in the rear or, on longer courses when a larger antenna is needed, outside the car.

The pit crew and chief generally wear a headset, with the chief's having a mouthpiece extending from one side of the headset.

The choice of brand lies with the team. Some of the larger, more well-known racing teams have sponsorship deals with the maker where the equipment is provided at no cost in return for publicity on the car itself in the form of logo decals. Most teams, however, buy their own equipment.

Every racing class or group of classes is governed by a sanctioning body which orchestrates the racing season by setting rules and specifications, maintaining statistics, and awarding championships. These organizations also maintain their own communications networks at the track.

Most sanctioning bodies have two networks operating during a race, one for the administration of the race, and one for race stewards and corner workers, all tied together by the race director.

IMSA (International Motorsports Association) and SCCA (Sports Car Club of America) both maintain dual networks. In these systems, the administration network provides coordination between the control tower, the race director, pit areas, emergency services, and time and score keepers. The second network is primarily for remote track areas, watched by race stewards.

"It's a lot of organizational stuff," said Sean Marchant of the SCCA. "Even during the race—who had the fastest lap, who won the race."

For those looking to listen for chaos or high drama surrounding a tense moment or a wreck, Marchant warns those listeners they might be disappointed.

"It's pretty controlled. The people who are working a race have been doing it for so long."

In addition, the sanctioning body maintains a computer file of quotes from drivers, race data, leaders after each lap and more for the press, all transmitted over the track network.

Larger sanctioning bodies, like CART (Championship Auto Racing Teams, Inc.), have similar networks, but utilize more individual channels. Most have sponsorship deals with equipment manufacturers or distributors.

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Cheryl Day Anderson

Nowadays, a good portion of the race fans come equipped with scanning gear to "see" another side of the race.

Larger broadcast media organizations also maintain their own networks at major races, with cameramen, on-air personalities, directors and spotters keeping abreast of what's happening over the course of the race and orchestrating their broadcast accordingly. The fast-paced action of the race itself makes close contact a must for those providing live or tape-delayed coverage.

In addition to voice traffic, many racing teams have telemetry systems set up within the car constantly transmitting data back to the pit on fuel mixture, engine temperature and more, saving the driver from having to send this information back by voice.

So all of this seems like pretty tame stuff, right? Not necessarily.

"There are times where drivers try to second guess our call from the pit," said Lotusports' team owner Jack Ansley, "and the discussion gets a little heated at that point."

In addition is the "underside" of all this, the knowledge that while you're listening to a given team, the other teams may be too.

Most drivers and owners, like Ansley, say spying on the competition isn't that important. But teams like Archer Brothers feel it's important enough to scramble and keep the competition in the dark -- even Ansley's Lotusports scrambled all communications until recently.

When racing on a track, whether oval or street course, the importance of communications varies with the distance. However, one type of auto racing depends on communication as a vital link in all circumstances, possibly even life or death.

Off-road racing puts drivers in rough, open country miles away from pits, control towers, or

even fans. Miles out in the desert, the transceiver is the driver's only link.

"It's extremely important," said Randy Anderson, crew chief for the Walker Evans Team. "It's not like asphalt racing. You may go 50 or 60 miles without seeing anybody."

"There've been times when (drivers) have needed to talk to us about other cars on fire."

Off-road racers typically pit every 100 miles, compounding the number and scope of things needed to be cared for in the pit stop and the need to transmit that data to the pit in advance of the actual stop.

Racing Gear

One of the biggest problems encountered by driver, pit crew and scanning-toting fan alike is the noise level at a race. If you've ever been to an auto race, it should be obvious that standard headphones and transmitting receiving equipment will not fit the bill.

"Everything we do in racing has to be modified," said Wilton King of Racing Radios, the biggest supplier of racing-modified equipment to fans and teams. "It's a totally different ballgame."

The microphones used by racing teams and officials are one of the major modification areas. Track noise has to be cancelled in order for a voice to get through. This is accomplished with a noise-cancelling microphone with entry ports for sound. The first, for the actual voice reception, sits on top of the microphone. On the sides of the microphone are two ports which trap and cancel noise through a balancing system. Essentially, noise coming from either side cancels

Frequency ranges to scan for auto racing action at the track:

151-154 MHz

461-469 MHz

851-869 MHz

The majority of the action can be found in the 461-469 MHz range. Some teams and sanctioning bodies make frequent changes in their operating frequencies, making a detailed list impractical and dated by the time of publication.

Report your catches in 1992 to *Monitoring Times* to keep everyone up to date.

itself out, allowing voice transmission to go through.

The push-to-talk button for handheld sets can be placed on one ear cup of the headset, allowing the unit to be belt-mounted, freeing up the hands of the user except to transmit.

The headset itself is a special design. Most are made by the David Clark Company which also makes headsets for use by airline cabin and ground crews.

Scanner buffs and racing fans can buy similar headphones, lacking only the microphone. In addition, scanners are available with increased volume capability for easier listening at the track.

For those who don't own or can't afford a scanner but still have a citizens band radio, action can be found here, too. Drivers at smaller races or entry-level teams at some intermediate races use CB radios for communication between driver and pit crew to lower costs.

And the action isn't limited to the auto racing circuit.

The October issue of *MT* contained a fine piece of listening at the football stadium. The same goes for virtually any other major sport event: golf, baseball, basketball,...

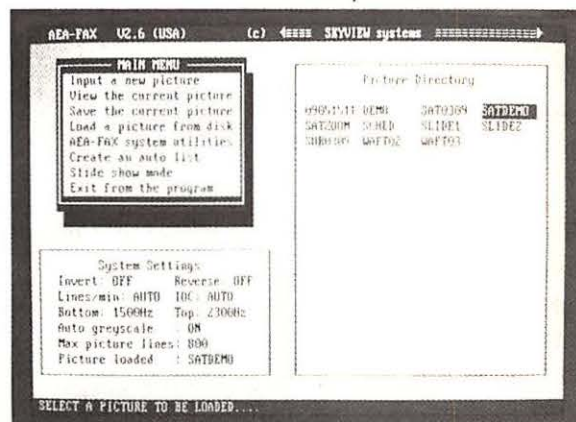
The next time you're out at the track, the stadium, or the arena, take along your phones and dial up the action behind the scenes. You'll be amazed what you can hear



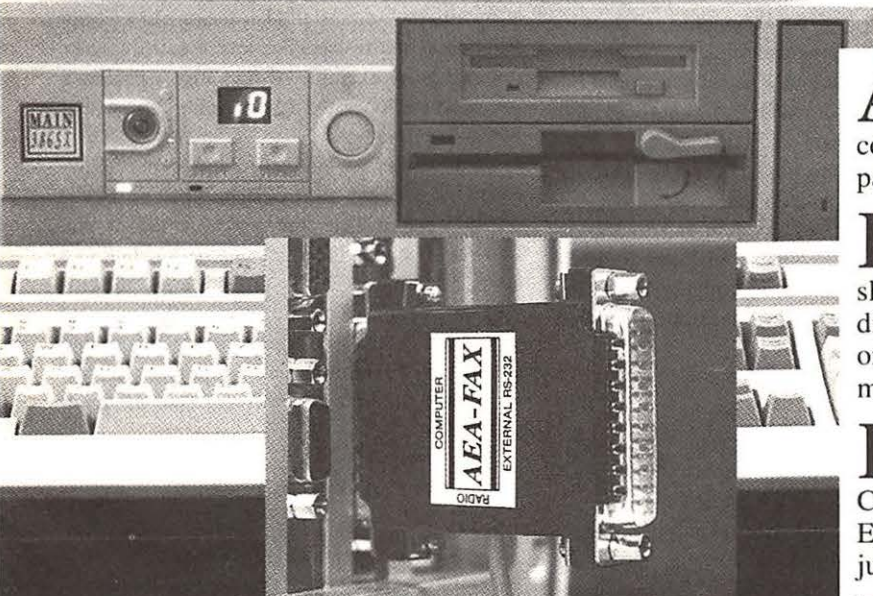
Thanks to Charles Nearburg of Nearburg Racing, Dallas, TX. Nearburg finished 5th overall in the 1991 Toyota Formula Atlantic series, described by Bobby Unser as "the best training class for Indy cars." The pictures of his Formula Atlantic car were taken by Cheryl Day Anderson. of Indianapolis.

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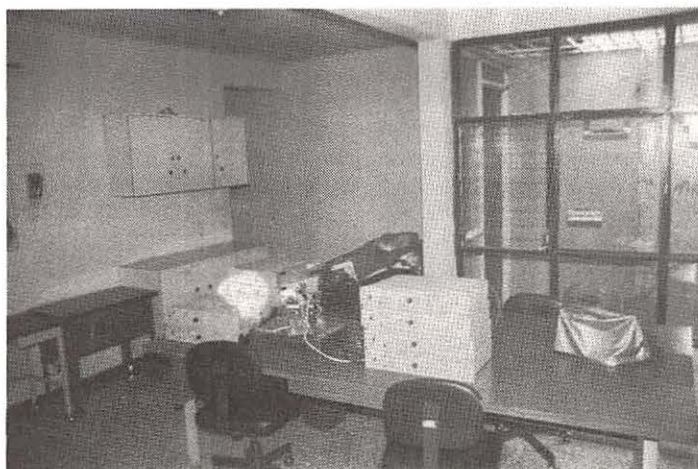
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The Last Days of Radio Impacto

By Don Moore

Radio Impacto's once bustling newsroom was empty and sterile at the end.



Suddenly, it was gone. For seven years, Radio Impacto had been one of strongest Latin American shortwave stations — and one of the most controversial. But, in one fell swoop, it was gone. "Mission accomplished?" some asked. Perhaps so. Let's take a close look at the station and its sudden end.

The Beginnings

The events all still seem so recent. It was only in July 1979 that the Sandinista guerrillas, aided by massive strikes and a general uprising of the Nicaraguan people, overthrew the Somoza family dictatorship in Nicaragua. The dictatorship had been one of Latin America's most ruthless, and its lengthiest. Family friends occasionally held the presidency, but there was never any doubt where the real power lay.

When such an entrenched regime falls, it doesn't just disintegrate. Thousands of members of Somoza's national guard and many Somoza family associates fled north across the border to Honduras. With help from the US, they would become the nucleus of the FDN, Nicaraguan Democratic Front, the primary "contra" group. Later, as the Sandinista government moved increasingly leftward, many Sandinistas became disenchanted with Daniel Ortega's government. They moved southward to Costa Rica, where former Sandinista Eden "Commandante Zero" Pastora formed ARDE, the Democratic Revolutionary Alliance.

Radio, of course, is important in any revolutionary effort, and the contras had their share

of stations. The FDN's Radio Quince de Septiembre began broadcasting not long after their move to Honduras. Eventually ARDE followed suit with La Voz de Sandino — claiming to be the true spirit of Sandinismo. Other clandestine stations such as Radio Nicaragua Libre and Radio Miskut aimed for different slices of the counter-revolutionary audience pie.

Meanwhile the Sandinista government fought back on the airwaves with Radio Sandino and La Voz de Nicaragua, and a chain of AM stations such as Radio Frente Sur and Radio Poder Popular. It was into this chaotic, highly politicized radio scene that Radio Impacto stepped in 1983.

Getting Started

It's unlikely we will ever know who originally decided to put Radio Impacto on the air. It is known, however, that Manuel Jiron Castrillo was the man given the job of doing it. A former broadcaster at Managua stations Radio Mi Preferida and Radio Amor, Jiron had close Contra connections. Officially, the owners of Radio Impacto were a group of Venezuelan businessmen in the firm "Inversiones Feranto, S.A." Little is known of this company, other than that it helped channel U.S. government funding and supplies to the contras.

Jiron's first job was to get an official Costa Rican license and frequencies — this was to be a legitimate operation, not another contra clandestine in the mountains. Getting shortwave frequencies wouldn't be hard as there are a lot of free channels in Central America, but because of

band-crowding in San Jose, AM frequencies are impossible to get except by buying out another licensee.

Jiron hired Roberto Hernandez Ramirez of Radio Centro to find an AM frequency for Impacto. Under Hernandez's direction, they bought out the license of a failing San Jose station, ABC Radio, 980 & 6150 kHz. (In the early 1970s, this station used the name Radio Atenea, and was an easy log on 6150 SW in North America.)

The frequencies were now in hand, but ABC radio's transmitters were too puny for what Radio Impacto needed. Twenty-kilowatt AM and SW transmitters were installed at the antenna site in Alajuelita, southwest of San Jose. Radio Impacto, following the example of San Jose's principal AM stations, operated AM repeaters elsewhere in the country.

There was an interesting difference, however. The other stations had high power transmitters in San Jose and low power one kilowatt repeaters in other principal Costa Rican towns. Radio Impacto installed a huge 50 kilowatt repeater in remote northwestern Guanacaste province, near the Nicaraguan border. No one had ever heard of installing such a huge repeater, two and a half times more powerful than the main station!

Impacto On The Air

AM transmissions began on April 11, 1983, with an ad in the local newspapers, and shortwave followed several weeks later. At this time, Impacto was a nondescript Latin station playing mainly Spanish pop music. The first reported loggings of the new station were made on May 28 by Ernie Behr of Ontario and Fritz Melberg of Iowa. Both noted strong reception and that the station was asking for reception reports. A few days later, on June 3, Robert Mills of California logged it and noticed there were no ads, which was rather strange for what was assumedly a commercial station.



The sudden departure of most of Radio Impacto's staff left some parts of the station very disorganized.

Gradually, Radio Impacto's programming began to evolve. In August, 1983, the station started its first "Impacto Noticioso" newscast, every half hour. Radio Impacto's extensive news broadcasts came from a variety of sources. The more conventional ones were via UPI and Agencias Latinoamericanas Noticias teletype. In addition, the station maintained a regular telephone contact with the FDN in Tegucigalpa. Official government press releases from Honduras and El Salvador were relied on for news from those countries. For news of the war in El Salvador, Radio Impacto reported directly from official Salvadoran Defense Ministry Reports, hardly an unbiased source.

Programming began to emphasize events in Nicaragua from an anti-Sandinista viewpoint more and more. In a program called "Love Letter to Nicaragua," former Somocistas and renegade Sandinistas criticized the Sandino government and boasted of the day they would take over. Radio Impacto began occasional relays of both Radio 15 de Septiembre and La Voz de Sandino. All of this seemed quite out-of-character for a station purported to be a local Costa Rican broadcaster.

Thus, it wasn't long before DXers, and Central American news analysts, began to suspect that there was more than a casual relationship between the Radio Impacto and the Contra rebels. Radio Impacto wasn't, however, without its humorous moments. In December 1983 it had to stop its all-night broadcasts because of problems with the announcers drinking on duty!

More Strange Happenings

Unusual goings-on surrounded Radio Impacto from the beginning. By the end of 1983, station director Manuel Jiron had been fired by the powers behind the station. Rather than leaving quietly, Jiron wrote a book, *Exilio, S.A.*, in which he denounced the station he set up. He then sued the station for good measure, although he lost the court case.

Radio Impacto did little to hide its contra connection. On its staff were an official spokesperson for the FDN, some announcers from former Somoza radio stations in Managua, and several former staffers for "La Prensa," the primary anti-Sandinista newspaper in Nicaragua. Elsewhere, Impacto's Tegucigalpa correspondent actually doubled as the FDN's local spokesman.

The strongest evidence for the contra connection came from Edgar Chamorro, former director of communications for the FDN, who told the World Court that Impacto was a CIA operation. Despite this, in 1987 Alfredo Cesar, then head of the Contras in Costa Rica, denied to Radio Sweden DX editor George Wood that there was any contra connection to Impacto.

The Sandinistas, as would be expected, reacted to Radio Impacto. For a while Radio Impacto and Radio Sandino played a game of frequency cat-and-mouse in the 49 meter band as Radio Sandino plopped down right next to Impacto's frequency, and then Impacto hopped around trying to find another clear channel. Eventually Radio Sandino moved up to 6200 and Impacto settled on 6150, with the eventual addition of 5030/5044.

"In 1985, the powerful signal from Radio Impacto was one of the most clearly heard throughout Nicaragua" (Soley & Nichols, p246). A few years later, Radio Sweden's George Wood wrote that "The biggest media threat to Nicaragua comes from Radio Impacto." Adrian Roque, head of the news department at La Voz de Nicaragua agreed with him, stating that Radio Impacto "... (is) our most important competition... we're forced to be better, especially in our news coverage."

Secretive Nature

While Radio Impacto was loud and boisterous on the air, locally it tried to remain secluded in suburban San Pedro de Montes, outside San Jose. No sign was ever put up to advertise the station's presence, and visitors were not given friendly treatment, quite unusual for a Latin American station.

Japanese DXer Takayuki Inoue visited Radio Impacto in 1985 and noted "The station building is in an ordinary house, and it is hard to

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Juan Carlos Aguero at the controls during one of Radio Impacto's final broadcasts.

imagine a radio station from the outside... I was quite embarrassed by the cold attitude to me" (Inoue, 1987).

Austrian Christian Zettl stopped by not long afterwards and wrote "It appears the station is not very interested in visitors—I had to try two times until they finally let me in, only after declaring precisely the purpose of my visit and after handing over a personal identification. The person in charge of receiving visitors turned out not to be very willing to provide any in-depth information" (RIB 104). Later, when Radio Sweden DX editor George Wood tried to visit the station, he wasn't even allowed inside.

Each of the three visitors had comments on Radio Impacto's programming. Inoue noted that there was much greater emphasis on reaching a Nicaraguan audience than a domestic, Costa Rican, one, and concluded "Though they pretend to be a usual commercial radio station, I would rather call them a 'semi-clandestine' station" (Inoue, 1987). Zettl reported that the Costa Rican media was anti-Sandinista in general, but that Impacto was the most outspoken. In fact, Costa Rican journalists told him that "Radio Impacto is controlled by anti-Sandinistas with close ties to the FDN and that its SW is aimed at Nicaragua."

In 1988, Costa Rican Public Security Minister Hernan Garron Salazar, talking to reporters, called Impacto a Contra station and admitted that his department had no idea of who really owned the station. However, he noted, it was a legally licensed station under Costa Rica laws, and as a democratic government Costa Rica had no right to censor or interfere with it in any way.

Panama Connection

As the 1980s progressed, the contras didn't succeed on the battlefield, but continued to be a formidable military force in the region. The biggest threat to the contras came not from Nicaragua, but from Washington D.C. When the Iran-Contra scandal surfaced, the U.S. Congress

became far less compliant to the Reagan administration's requests for funding the contras. But, with the help of a little belt-tightening, and some say drug-smuggling on the side, the contras survived.

According to sources in Costa Rica, contra belt-tightening included a decrease in funding for Radio Impacto. Without a new source of income, Radio Impacto's continued existence was in jeopardy. Radio Impacto was in luck, as it was just then that the Manuel Noriega affair reared its head in Panama. The U.S. was now out to get Noriega, and radio propaganda would again be an important part of the campaign. Radio Impacto was in the perfect position to become the primary anti-Noriega station.

A new fifty kilowatt repeater was installed near Cahuita, on Costa Rica's Caribbean coast, south of Limon. Huge directional antennas towards Panama took advantage of the all-water path to make Radio Impacto one of the best heard stations throughout Panama.

By the time Manuel Noriega held elections in Panama, in Spring, 1989, Radio Impacto had become the most listened to station in Panama. The Sandinistas had clearly taken a back seat to Manuel Noriega in Radio Impacto's war of words. While reports that Radio Impacto transmitted coded messages to U.S. forces may have been the result of overactive imaginations, clearly Radio Impacto was "the station of the invasion," as some maintain. No other broadcaster followed the fall of Manuel Noriega so closely.

Noriega was gone, but it was time for Radio Impacto to turn its attention back to Nicaragua, because President Daniel Ortega was up for reelection on February 25, 1990. After ruling the country under a revolutionary junta for five years, Ortega had been elected president in 1984. In the 1990 elections, the contras and other Sandinista opponents united under the Union Nacional Opositora (UNO) party. At its head was Violeta Chamorro, widow of Pedro Chamorro, a

popular Nicaraguan journalist who was assassinated in 1978 by henchmen of the former Somoza dictatorship.

Although Chamorro was well known, most observers and all the polls indicated that Ortega would win by a wide margin. UNO, however, had a very deep campaign chest and lavishly spent on promoting Chamorro's candidacy. Radio Impacto did its part by airing numerous commercials for UNO, in direct violation of international agreements prohibiting interference in the elections of other nations. Almost everyone, including Radio Impacto, was probably surprised at Chamorro's victory.

While Impacto may have been surprised, it was also jubilant. Still, Radio Impacto closely followed the Nicaraguan scene until Chamorro was officially sworn in as Nicaragua's president on April 25, 1990. Now, suddenly, Radio Impacto no longer had a purpose.

Hunting Down Impacto

Like everything else about Radio Impacto, its end was shrouded in secrecy. By chance, it was then that my wife and I made a long-anticipated trip to Costa Rica, which would of course include numerous station visits.

A few days after arriving, I visited Radio Reloj (700/4832/6006) for a long visit with station manager Roger Barahona, a long time veteran of Costa Rican broadcasting. When I asked Senor Barahona what he thought of Radio Impacto, he expressed the usual answer I got from Costa Ricans—that it was a political station, somewhat of an embarrassment, and probably financed by the CIA. I had, of course, heard that it was for sale, hadn't I?

My mouth dropped open. Yes, he continued, the timing was very interesting—just days after Chamorro's inauguration in Managua. With the Sandinistas out, what was left for Radio Impacto to do?

Senor Barahona wasn't very optimistic for the future of the station. He couldn't imagine anyone wanting to buy it—it was "a white elephant." No one in Costa Rica needed those 50 kilowatt repeaters in Guanacaste and Limon, nor the 20 kilowatt shortwave transmitters. Even the main 20 kilowatt AM transmitter in San Jose was more powerful than needed to reach the San Jose metro area. The electric bills would break anyone without deep pockets. Only the AM frequency of 980 kHz had some value, but not with those power-gobbling transmitters.

A few days later, Senor Lafuente of Radio Rumbo (530/6075) agreed with Senor Barahona, adding that Impacto was, in fact, "a BIG white elephant."

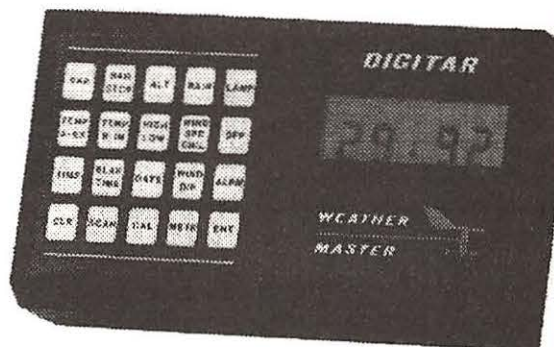
So, a few days later Theresa and I took a local bus to suburban San Pedro de Montes. San Jose does not use street numbers; instead addresses are given in terms of how many meters they are

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from an important landmark. In typical San Jose fashion, the telephone book gave an address of "25 meters southeast of the Higuaron." With the help of passersby, we located the Higuaron, which turned out to be a large tree on an island in the middle of the street!

We looked around, but there was no sign. Nor did any of the houses have guards, as others had reported. The presence of a radio station was only marked by a fifty foot antenna in the middle of the block — obviously a studio transmitter link. But, it was impossible to tell exactly which house it belonged to. It took eight tries to find someone who knew — Radio Impacto had kept itself well hidden, even from the neighbors!

The Last Days

Unlike other DXers in the past, we had no problem getting inside Radio Impacto. The gate was unlocked, so I went up and knocked on the door. A few moments later, the door was opened and a friendly face appeared. I explained who we were, and we were invited right in. Our host, Juan Carlos Aguero, knew all about DXing. He had been a DXer himself for ten years and a ham operator for five. He had worked at Radio Impacto since its beginning and was now helping close it down.

Radio Impacto was like a skeleton. Once bustling rooms were now deserted. The recording studio in the back of the house was now dusty and unused. Desks were empty and cleaned out. Cardboard boxes were piled on tables. Cassettes, papers, and odd electronic parts were scattered everywhere. In the newsroom, the teletype machines were turned off. A Kenwood R-600 receiver that had been used to check the latest news from the major shortwave broadcasters was now gathering dust. Still, signs of Impacto's past abounded, such as the bumper stickers on the walls. One proclaimed "In Costa Rica for the democratization of Panama," while another with a Panamanian flag said, "With the OAS or without the OAS, we shall continue the fight."

The only thing that remained the same was the studio. The cassette decks, cartridge machines, and turntables were still there, and records and tapes lined the tables. Posters of pop groups covered the walls and "Radio Impacto" was spelled out on them in huge red letters.

Perhaps because of the experience of years of secrecy, Juan Carlos avoided giving much detail about the station's operations. However, he seemed happy at the lack of security at the station, which he pointed out was no longer necessary since they were up for sale. The closest he came to giving some background about the station was when I asked why Radio Impacto didn't have a sign. "We're in an unmarked house because we're a political station . . . no, because we want democracy like Costa Rica has for those who don't have it."



Radio Impacto's address was 25 meters southeast of the Higuaron. This tree is the Higuaron.

As Juan Carlos explained, everyone at Radio Impacto had been ecstatic after Violeta Chamorro's victory and then inauguration as president of Nicaragua. But, it was just days after the inauguration that the staff was called in to a meeting and told that the station was being sold and would be closed down in early June. Layoffs among the 20 person staff began immediately.

A month later, at the end of May, only five were left; an administrator, an accounting clerk, and three announcers, including Juan Carlos. Juan Carlos explained that this made his job "polyfunctional": between the usual DJ duties of spinning disks, he had to answer the phone (which now rang in the studio), answer the door, show visitors around, and in general keep an eye on things. He lamented about how in the old days announcers were pampered so they could concentrate on their jobs. "Before someone would bring you coffee if you wanted it, but now you must make it yourself."

Obviously Juan Carlos' duty as an announcer now was simply to fill up air space. During the hour we were there, he played entire LP sides, inserting taped ID announcements and maybe a live time announcement after each side. A little dead air wasn't important; nor was it important when the telephone rang beside the microphone. His duties did not extend to security, which had fallen by the wayside. A few years before, a Costa Rican reporter had been interrogated by Impacto's security staff for taking a picture of the front of the building. Yet while Juan Carlos was on the phone, we were free to roam the rooms to take pictures.

I asked Juan Carlos how much time he had left at the station. He would be there until the end, which was scheduled to be June 10. After that, I asked? He wasn't worried about finding a new job. He pointed out that he had lots of experience and plenty of contacts in the San Jose radio scene. I wished him luck.

Postscript

Radio Impacto didn't close down on June 10, as expected. Canadian DX Richard McVicar,

who was studying Spanish in Costa Rica in preparation for working at HCJB, stopped by on June 21 and had a long visit with Juan Carlos. By that time, Juan Carlos was the only staff member left. Programming was simply cassette tapes of music with occasional IDs. Sometime after that, Radio Impacto finally did go off the air forever.

At the end of July, a buyer was found — for the AM frequency and the 20 kilowatt AM transmitter. Parmenio Medina, a long time staff member at San Jose's Radio Sonora had put together the money. Reportedly he paid six or seven million colones, with 500,000 colones down. In dollars, that was about sixty to seventy thousand dollars, with five thousand dollars down! The new station would be called Radio Cordillera and was to have begun transmitting on September 1, 1990.

The shortwave transmitters took a little longer to sell, but were not quite the "white elephant" some imagined them to be. Small scale international broadcasting is an up-and-coming industry in Costa Rica. There were reports that Radio For Peace International bid on the SW equipment, but apparently their bid was not enough, or the conservative owners were uncomfortable with RFPI's politics. Instead, the shortwave equipment and the 50 kW medium wave transmitters were purchased by Adventist World Radio's Costa Rican station.

AWR has moved all their new and old transmitting equipment to the old Impacto medium wave site at Cahuita. By the rule that transmitter sites are stations, this creates a new shortwave station, even for those who have already verified the old AWR site and Radio Impacto.

That's the story of Radio Impacto. It's gone, and we won't hear anymore about it. At least not until someday in the remote future when secret U.S. government documents about the contra war are declassified . . . or a CIA agent involved in Central America tells all in a kiss-and-tell book. It may never happen, but if it does, it will be interesting. There are surely many more secrets to be told about Radio Impacto!



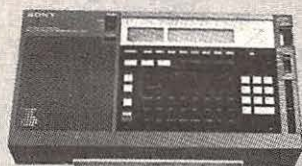
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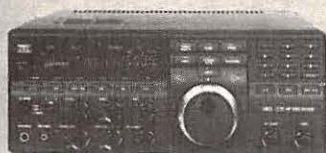
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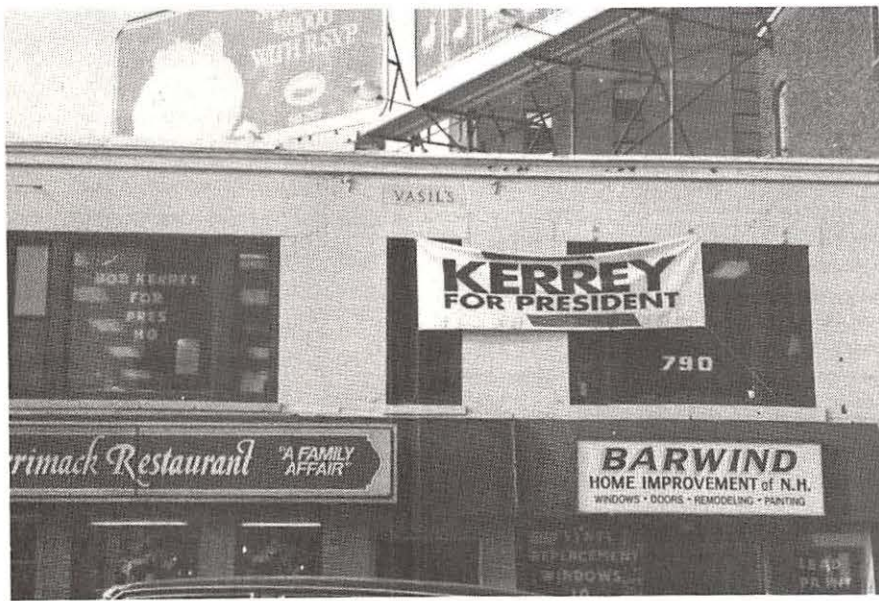
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Story and photos by Everett L. Slosman



Campaign headquarters setup in New Hampshire storefronts. Bob Kerry's location is over Manchester's most popular downtown restaurant; a place where political deals are often cooked up.

Escaping from the upcoming presidential primary follies may be almost impossible. Newscasters ladle large doses of candidate rhetoric within their reports. Political consultants prepare vote-for-me commercials designed to avoid an informed electorate. And candidates make personal appearances in order to grab your hand while campaign managers pick your wallet.

Presidential primary campaigning begins in New Hampshire and Iowa and continues until a few weeks before the summer conventions. After hearing pundit number 64 tell you what the candidate said, politics American-style becomes predictable and boring.

The cure lies in monitoring the campaign action, not the distilled pap handed out by the candidates. If nothing else, the unguarded foibles produced by situational stress should furnish a couple of good laughs.

Two monitoring options exist; scanning the federal, state, or local action or setting up a coordinated frequency search. My home state's impact is disproportionate to its size and the hopefuls flock here in record numbers. Therefore, I prefer a coordinated search. To simplify the task, I use a relational database program to generate a printout like the one shown in Table I.

First, contact state Democrat and Republican headquarters in the state capitol. Ask for a copy of the presidential candidate appearance schedule and to be placed on their update distribution list. They can also furnish a list of campaign



Strategy time as the campaign workers get their daily "vote getting" orders.

office locations which will also have appearance information. Usually, headquarters volunteers will be very helpful. But, to avoid the raised eyebrows and suspicious looks, don't tell them you plan to monitor the candidates' radio transmissions.

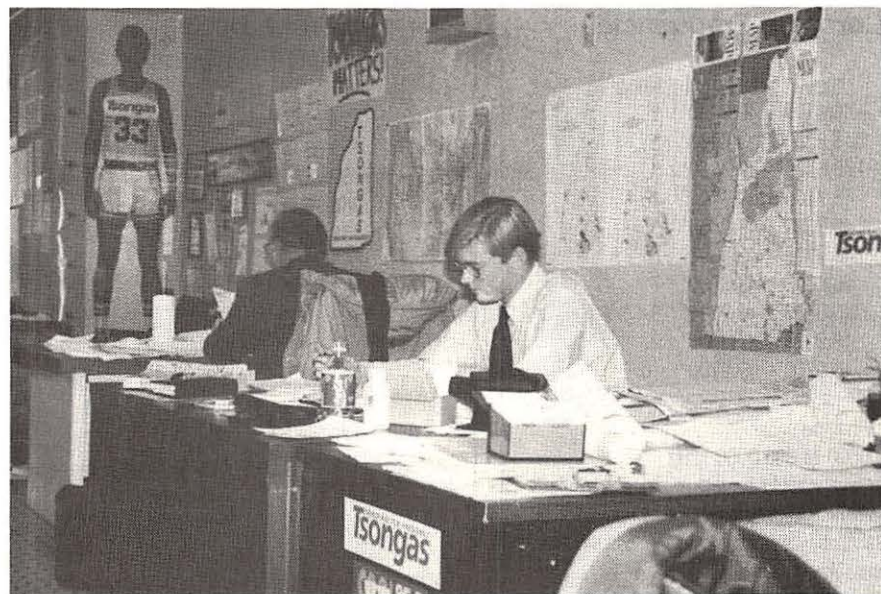
Security and protection rank among the most exciting monitoring aspect of a campaign. Table II provides data on known Secret Service channels and Table III covers some of the codes used.

Other agencies include state, county, and municipal police forces, news media, ground transportation, and private security firms. And don't overlook the possibilities of mobile and cordless phones. Table IV lists the base and handset frequency for cordless units and handheld low power units sometimes used by civilian volunteers. The chart in Table V covers White House and DC communications.

Only major party candidates are entitled to Secret Service protection; so before this is extended they must rely on local and state law enforcement agencies. Only congressmen have the right to federal protection before they become official candidates. The President, however, may order the Secret Service to protect a candidate who has not yet qualified.

Political reporters assigned to specific candidates feed audio and video back through VHF transmitters operating on assigned press frequencies or via satellite transmissions similar to the setups used in the Persian Gulf.

Scan 152.8700 to 153.0200, 161.6400 to 161.7600, 170.1500, 173.2250 to 173.3750, 450.000 to 451.0000, 452.9265 to 453.0000, 455.0000 to 456.0000, 471.4625 to 471.8125, 483.4625 to 484.8125, 489.4625 to 489.8125, 501.4625 to 501.8130, 507.1625 to 507.3120, and 944.0000 to 947.0000



The Tsongas campaign starts early and works late. Here, two volunteers are setting up campaign stops for the candidate. The Larry Bird poster emphasizes the candidate's ties with Massachusetts and the Boston Celtics.

Table I Sample Monitoring Guide

Date: 02-06-92 Candidate: Joe Politico
Events: Manchester LWV Location: NH College gym

Starting Point: Airport Time: 1430 EST

Frequencies:	Agency:	Channel:
127.3500	Approach/departure	1
153.7400	Airport security	2
154.9650	Ambulance	3
155.2800	Hospitals	4
156.2100	Police Dispatch	5
155.4750	State Police Statewide TAC	6
164.1000	President, V-P protection	7
164.4000	President, V-P protection	8
164.6500	President, V-P protection	9

En Route: 293 to exit 7 Time: 1500 EST

Frequencies:	Agency:	Channel:
154.9650	Ambulance	3
155.2800	Hospitals	4
156.2100	Police Dispatch	5
155.4750	State Police Statewide TAC	6
164.1000	President, V-P protection	7
164.4000	President, V-P protection	8
164.6500	President, V-P protection	9
165.3750	Command post	10
165.7625	Input to Charlie repeater	11
166.2125	President, V-P protection	12

Ending Point: Airport Time: 1845 EST

Frequencies:	Agency:	Channel:
127.3500	Approach/departure	1
153.7400	Airport security	2
154.9650	Ambulance	3
155.2800	Hospitals	4
156.2100	Police Dispatch	5
155.4750	State Police Statewide TAC	6
164.1000	President, V-P protection	7
164.4000	President, V-P protection	8
164.6500	President, V-P protection	9

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Air travel remains the favorite mode for hopping around a large state and for traveling between states. Monitoring approach/departure and airport security frequencies can pay off, but don't forget to try 118.000 to 121.400 air traffic control; 121.600 to 121.925 ground traffic control; 121.950 aviation support; 122.000 to 122.050 en route flight advisories; 122.750 private aircraft, air-to-air; and 122.825 aeronautical en route.

Ground transportation divides into two frequency sets: private VIP livery service and en route road security. Making the state police interagency or statewide tactical frequency the priority channel could yield surprise catches.

And don't ignore the hospital and medical disaster frequencies. They are usually on standby whenever a presidential candidate comes to town.

Since many events are held in hotels and conference centers, consider adding their frequencies to your lists. Don't forget the local private guard and security companies. They often supplement the work done by the government agencies.

Make sure you have the latest editions of *Police Call Radio Guide*, *The Top Secret Registry of U. S. Government Radio Frequencies*, and *Federal Assignments Frequency Assignments MasterFile*.

Copies are available from Grove Enterprises or other book suppliers who advertise in *Monitoring Times*.

During the campaign, stay tuned to our regular columnists for updates on frequency and code identifiers, so you'll be in tune with the presidential primary action.



Table II
Selected Secret Service
Frequencies

<u>Freq (MHz)</u>	<u>Identifier</u>	<u>Reported usages</u>
32.2300	Able	White House communications vans
34.0700		Vice-Presidential Staff
162.6875	Yankee	Uplink to aircraft Zulu
164.1000 (S)	Victor	President, V-P protection
164.4000 (C)	Papa	President, V-P protection
164.6500 (S)	Tango	President, V-P protection, pagers
164.8875	Oscar	Presidential limo, family
165.0875 (RS)	Uniform	National Radio System
165.2125 (RS)	Mike	Dignitaries protection
165.3750 (RS)	Charlie	National primary and command post
165.6875 (RS)	Hotel	National Radio System
165.7625 (C)	Golf I	Input to Charlie repeater
166.2000 (C)	India	National Radio System
166.2125	Hotel	President, V-P protection
166.4000 (C)	Golf	National Radio System
	Romeo	Input to X-Ray repeater
166.4625	X-Ray	Common channel repeater with Alcohol, Tobacco and Firearms, Customs, and Internal Revenue Service
166.5125	Alpha	Escort and Security
	Sierra	President, V-P protection, pagers
167.0250	November	White House communications staff
	Whiskey	White House communications paging net
167.7875	Lima	White House communications staff
167.8250	Kilo	White House communications staff
168.7875 (RS)	Baker	President, V-P escorts
169.9250 (S)	Delta	White House communications vans, phone patch
170.0000	Juliet	White House communications paging net
171.2875	Zulu	Downlink to ground Yankee
407.4500 (D)		Limousines
407.4750 (D)		Uplink Nationwide-Two
407.8500 (D)	Echo	Uplink to aircraft Foxtrot, Nationwide-One
407.9250	India	President, V-P protection
408.2000 (D)		Limousines
415.7000 (D)	Foxtrot	Downlink to ground Echo, Nationwide-One
415.8000 (D)		Downlink Nationwide-Two

C = Control D = Duplex R = Repeater S = Simplex

Sources: *The Top Secret Registry of U. S. Government Frequencies*, *Frequency Assignment MasterFile*.

Table III
Selected Code Names

Code names are assigned by the White House Communications Agency and are subject to change and modification. This list includes codes from Air Force in-flight communications.

<u>Code</u>	<u>Designates</u>
Air Force One	President's airplane. Uses "Angel" when President is aboard.
Air Force Two	V-P's airplane. Uses "Treasure Ship" when V-P is aboard
Army One	President aboard Army helicopter
Army Two	V-P aboard Army helicopter
Bandbox	Executive Protection Service
Bulldog	Protective Support Division
Companion	V-P's residence (Blair House)
Crown	White House
Executive One	President aboard non-military flight
Executive Two	V-P aboard non-military flight
Executive (#) Foxtrot	Family member aboard any flight
Halfback	President's follow-up car
Hercules	Presidential Navy helicopter
Holly	Presidential Army helicopter
Horsepower	White House protection unit
Huntsman	Surveillance helicopter
Lizard	White House command radio vehicle
Marine One	President aboard Marine helicopter
Marine Two	V-P aboard Marine helicopter
Nighthawk	Presidential Marine helicopter
Pacemaker	V-P radio net
Patroller	V-P helicopter

Table IV
Cordless Frequencies

<u>Base</u>	<u>Handset</u>	<u>Channel</u>
46.6100	49.6700*	1
46.6300	49.8450*	2
46.6700	49.8600*	3
46.7100	49.7700*	4
46.7300	49.8750*	5
46.7700	49.8300*	6
46.8300	49.8900*	7
46.8700	49.9300*	8
46.9300	49.9900*	9
46.9700	49.9700*	10

Cellular Phones

870.0000 to 890.0000 MHz.

Listeners should be aware that the Electronic Communications Privacy Act of 1986 prohibits monitoring the cellular phone frequencies.

Low Powered Handheld Transceivers

Frequencies marked *

Table V
White House
and DC Frequencies

<u>Frequency</u>	<u>Assignment</u>
162.6875	Aero telephone
162.8525	Staff
165.9250	Staff
166.9250	Staff
167.0250	Staff
167.8250	Staff
168.7850	Staff
169.9250	Messenger
171.2875	Staff, aero telephone
172.3650	Mobile telephone
172.3950	Mobile telephone
172.4250	Mobile telephone
407.8500	Aero telephone
415.7000	Aero telephone

Source: *Top Secret Registry of U. S. Government Radio Frequencies*



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Radio Polonia:

65 Years of Reaching the World

By Larry Miller

Virtually all of Poland's modern history in the decades before the 1990s can be written off as irrelevant. Poland was, before that date, just another increasingly unstable, rusting hulk of a communist country, one of many dotting eastern Europe like shipwrecks on some remote beach.

Using the word "unstable" to describe pre-1990 Poland is, in reality, a gross understatement. According to renowned economist Jeffrey Sachs, the situation was collapsing at a terrifying rate. By October of 1989, the annual inflation rate had topped 10,000 percent and Poland was bankrupt, owing \$40 billion in unpayable debts to the west.

Goods had disappeared from store shelves and could be found only after hours of queuing, or by paying bribes, or by dealing in the black market. Faced with this desperate situation, the Solidarity government took an unprecedented plunge, changing the economic system to a market economy. Going directly from communism to capitalism was, as one quip had it, "Like making an aquarium into fish soup."

It was under these trying circumstances that Radio Polonia, the voice of Poles abroad, took some drastic moves of its own.

Proud Station, Proud History

Poland was not always the listing ship of more recent times. It has led the world in such areas as music, radio technology, even the creation of an artificial language, Esperanto. Even today, Poland claims the strongest long-wave transmitters in the world. So strong are they that in the mid 1970s, their power had to be halved because of complaints from all over Europe. (Listeners all over Europe can hear Polish Radio's Channel One on 227 kilohertz. Experienced DXers

Quick Reference Guide to Radio Polonia Programming in English

News Section:	News bulletin, Polish press review, commentary. Opens every broadcast.
Panorama:	Stories and interviews focusing on the Polish scene. Hosts: Jacek Detko and Michal Kubicki. Wed: 1600, 2230, 2305 UTC Thu: 0630, 1630, 2000 UTC
Focus:	The arts and entertainment in Poland, hosted by Rafal Kiepuszewski, Michal Kubicki and Miroslaw Lubon. Thu: 1600, 2230, 2305 UTC Fri: 0630, 1630, 2000 UTC
Postbag:	A review of listeners comments and queries. Hosts: Jacek Detko, Ann Flapan and Mari Goc. Mon/Fri: 1600, 2230, 2305 UTC Tue/Sat: 0630, 1630, 2000 UTC
Topic of the Week:	A discussion by Karol Szyndzioloz. Sun: 1200, 1430, 1600, 2230 UTC Mon: 0630 UTC
What We Said:	A digest of the week's best programming from the English Service. Sat: 1600, 2230, 2305 UTC Sun: 0630, 1630, 1830, 2000 UTC
Jazz, Folk, Rock and Pop:	The music scene in Poland, alternates with. Sat: 1830, 2305 UTC Sun: 1200, 1430 UTC
Top Twenty:	Hosted by Rafal Kiepuszewski.
DX Club SpotRadio:	Polonia's telecommunications magazine. Hosts: Marek Lasota, Jacek Trela and Slawek Szefs. Tue: 1600, 2230, 2305 UTC Wed: 0630, 1630, 2000 UTC Sat 1200, 1430 UTC
Request:	ConcertMusic requests and dedications hosted by Stella Zielinska. Sun: 1600, 2230, 2305 UTC Mon: 0630, 1630, 2000 UTC

Time (UTC)	Frequency
0630- 0700	7270, 9675
1130- 1200	5995, 6095, 11815
1200- 1225	6095, 11815
1430- 1455	6135, 9540,
11815	
1600- 1630	6135, 9540
1630- 1700	9525, 11840
1830- 1855	5995, 6135,
7285	
2000- 2030	9525, 11840
2000- 2100**	6095, 6135, 7270, 7285
2230- 2300	5995, 6135, 7270, 9675
2305- 2355	5995, 6135, 7270, 9675

*Chopin Concerts
**Night Concerts (Classical music)
Schedule Courtesy Radio Polonia

in North America may be able to pluck the 2,000,000 watt signal from the airwaves on an occasional basis. The station announces as "Tu Polskie Radio Warszawa w programie pierwszym."

Although experimental broadcasts had been carried out for some years, Poles officially mark the start of radio in their country as 1926 when regular broadcasts first got under way. Within three years of that date, other radio stations had sprouted across Poland. All were local, but despite this, it didn't take long for the idea of a central, national transmitter to crystallize. 1931 saw the opening of the Raszyn radio station near Warsaw. Raszyn was capable of covering all of Poland with its signal.

The origins of Radio Polonia — Polonia is a word describing Poles living abroad — can be traced back to 1936 when the Polish Radio initiated its first external service. At first, the broadcasts consisted of short Polish language broadcasts for people of Polish descent living elsewhere in Europe. In time, programs for North American listeners were launched, some featuring classical music concerts. For many shortwave listeners of the 1930s, it is these broadcasts that bring back the fondest memories of Radio Polonia; the brilliant piano music of Chopin, twinkling eerily through the wavering ether.

Radio Polonia continued broadcasting its popular external services until the outbreak of World War II in 1939 when all Polish radio left the air. The nation remained mute for five years until, on New Year's Eve, 1944, a station located on the already liberated part of Polish territory took to the air. External services would have to wait, however.

A New Flower Blossoms

Regular external services began anew in 1950, announced by the station's interval signal, the first bars of Chopin's Revolutionary Etude. "Those were the glory days for the station," reminisces Jacek Detko, editor of the English Language Service. "Radio Polonia was a powerful international broadcaster with its own spacious building, highly-skilled personnel, and state-of-the-art equipment." At this time, the station produced programming in 16 languages and received 60,000 letters a year.

"Today it is different," laments Detko, "but only because nothing much has changed. Due to the wear and tear on both the equipment and people, the service has been downsized considerably. Still, 11 languages have been preserved." Recently, there has even been talk of starting a special section for listeners in Lithuania, Byelorussia and the Ukraine, the Soviet republics bordering on Poland. All have large Polish communities.

One service that did not survive the turmoil of the new Poland is English to North America.



Courtesy National Geographic Society

The Polish people and Radio Polonia are both inheritors of a provider past. Wear and tear has reduced them to a subsistence level existence, but they continue to endure and to dream.

It, says Detko, was dropped several years ago "for both financial and political reasons." Broadcasting insiders speculate that the obvious ineffectiveness of the worn-out transmitters may also have had something to do with the decision. During the 1980s, Radio Polonia's shortwave broadcasts to America were an unreliable catch at best. And, given the times, it's likely that their eight ancient transmitters were probably operating at far below their stated 100 kilowatts.

Under the old communist regime, accurate technical information from Poland was difficult, if not impossible to obtain. We now know, however, that Radio Polonia has eight shortwave transmitters — seven with 100 kilowatt capacity and one officially listed as 750 watts. (Author's note: This is probably a typo and should read 75 kilowatts.) There is also a 300 kilowatt mediumwave transmitter working the airwaves on 1503 kHz, a split frequency that offers an enormous challenge to the hard-core broadcast band DXer.

Still Friends

Today, despite Lech Walensa's pleas to the United States for money and closer ties, the English North American service remains unwisely off the air. Still, there are other English broadcasts from Radio Polonia that can be snatched from the airwaves — nine of them, in fact. (See accompanying schedule.) One of the most treasured, though, remains those traditional classical music concerts, transmitted today over those same ancient transmitters that first carried the entrancing music of Chopin to the world in the 1930s.

Peak your receiver and hope for good conditions. Listen attentively at 1130 UTC on 5995, 6095 and 11815 kHz and you might, for a moment, get a glimpse at the glory days of a once powerful international broadcaster.



Economic data courtesy "World Monitor, The Christian Science Monitor Monthly."

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Scrounge CB

By Benjamin D. Meyer



1958 was a landmark year. Cars sprouted large vertical fins like predatory sharks and they were adorned with as much chrome as they could hold. Rock and roll music was in its heyday. I was a high school senior. And the FCC just authorized home brew equipment for the 27 MHz Citizens' Band.

For me, CB got off with a bang when I read Donald Stoner's article in *Radio/TV News Magazine*. The article described an easy-to-build four tube CB transceiver with a superregenerative receiver. This project was even better than the tube-type electronic ignition that I was contemplating building for my ancient Plymouth sedan. After all, power-hungry single-function tubes were all that we had. Transistors had just been invented and solid state chips and microprocessors were many years in the future.

I reviewed the article with my technical buddy and sidekick Bob and he decided to build one, too, so we could talk to each other. One obstacle we had to overcome was that the transceiver circuit described in the article required 110 volts ac for operation.

Being red-blooded American boys, we wanted to adapt the transceiver for 6-volt mobile operation so that we could travel around and impress the girls. Sam's Photofact came to the rescue with a schematic for a state-of-the-art (at that time) vibrator power supply. A vibrator power supply mechanically changed dc to ac so that it could be stepped up by a transformer and rectified back to the high voltage dc that was required by the tube plates. We decided to build the vibrator power supply onto the transceiver chassis in place of the ac supply.

With scores of others who had also read the article, we descended upon the local parts supply house like a plague of locusts to gather the parts we needed — over and above those that we cannibalized from TV chassis that we carted home from clean-up day or the landfill. Some of the parts were placed on back order due to the demand. All through the cold winter I labored over my project, solder gun and long nose pliers in hand, choking on rosin fumes.

After carefully filling in and filing FCC Form 505 and sending in the fee, the license finally came. We were assigned the callsign 2W2O59, units 1 and 2.

In early spring, I bolted the completed transceiver under the dashboard of my 1949 Plymouth Sedan. It was built on a subchassis that fit into an aluminum box. The front panel boasted three pilot lights; one for power, one for receive and one for transmit. A single toggle switch controlled power while two knobs controlled receiver volume and tuning. A two-position switch selected either the receive or the transmit mode. Who ever thought of a push-to-talk relay? What fun I had operating the transmit/receive switch while shifting gears!

Instead of the crystal microphone described in the article, we used a carbon telephone-type handset which was common in commercial two-way radio rigs of the day and would stand up better to the temperature changes and the rigors of the mobile environment. Audio was routed to the auto radio speaker since the radio had stopped working anyway. For the antenna, I mounted a surplus 27 MHz tank antenna on the filler plate that Plymouth had thoughtfully provided between the rear of the car and the bumper and painted the antenna silver.

Finally, the moment of truth had come. I fired up my unit. The tubes lit and the vibrator hummed happily but nothing else happened. A few voltage measurements disclosed that the power supply design that we had plagiarized was not up to meeting the needs of the powerhungry transceiver tubes. As a quick fix, my partner Bob installed a surplus motor-generator under his front seat to supply the plate voltage. I couldn't afford a motor/generator so I set about beefing up the power supply.

When I finally got the transceiver working, I discovered that although the superregenerative receiver described in the article was very sensitive, it was not at all selective. It brought in several CB channels and a VOA transmitter in Wayne, New Jersey, at the same time. It totally lacked any

intermediate frequency stages that make a superheterodyne receiver so sensitive. The receiver was simply an oscillator that resonated at CB frequencies. The transmitter was crystal-controlled operating on a single channel.

As CB was very sparsely populated in those early days, most of the time you heard nothing but background hiss. It's a good thing because the transceiver also lacked a squelch. Hearing another station was a cause for celebration and usually led to a personal meeting.

We actually went portable with this rig while the Plymouth was laid up for repairs. This involved my buddy dropping me off at a fixed location with a car battery to power the unit. You certainly couldn't call it hand held. But it was an experience; especially when Mom saw what the battery acid did to my pants and shoes.

I met some nice people through CB; mostly technical types. (They had to be to build their own rigs.) When the engine in my Plymouth blew, I transferred the transceiver to my 1953 Chevrolet. A new 102-inch stainless steel whip replaced the tank antenna.

To demonstrate how uncrowded CB was, when returning from classes at RCA Institutes, I could talk reliably from W57th street and the West Side Highway in New York City to Teaneck, New Jersey — a distance of over ten miles.

I sold my CB rig in 1961 for about what it cost me to build \$20.00. This was about the time that CB was starting to get crowded and I couldn't easily switch frequencies with my one channel rig.

Since 1958, CB and the world have never been the same. Today you can buy a solid state 40-channel CB rig with a sensitive superheterodyne receiver, push to talk, squelch, and measuring about a quarter of the size of mine for about \$50.00. Adding in 30 years of inflation, today's transceiver is a much better bargain than the one I built from scrounged materials.

Better buy, maybe. More fun? Never.

Direct Broadcast Satellites: Still With its Head in the Clouds

An editorial comment by Don Moore,
Big Rapids, Michigan

I've been following the progress of digital direct satellite broadcasting for some time now, and was very interested in the article on digital audio broadcasting in the January MT (p.22). I suspect that in the future, radio listening in the US will be limited to a few dozen satellite stations from the major cities. After all, we haven't had a very good record at protecting small local businesses from big companies. Just look at any small town and how the national chains have driven local businesses out of business over the past thirty years!

However, I wonder how much proponents of direct satellite broadcasting really understand the Third World. I spent three years in Honduras in the Peace Corps and have traveled extensively in Latin America. I see several flaws in introducing satellite broadcasting to underdeveloped countries.

On the surface, direct satellite broadcasting makes a lot of sense in Africa. It's a cheap way to cover a vast area, and because broadcasting in most African countries is controlled by a central station in the capital city, there are no local broadcasters to be put out of business. But, has anyone thought about whether or not people in Africa can actually afford a \$100-\$200 radio, plus the amplifier it will need? Take a look at the average annual income in these places. In some countries it's not much more than that.

By comparison, Honduras is better off than most African countries, yet the minimum wage, which many people make, is only \$2.50 a day - barely enough to feed a family. Most people do manage to save enough to buy a \$10-15 transistor radio for local stations. But the majority of Honduran families could never afford \$100-\$200.

In most Third World countries only a small affluent minority could afford these receivers - although they would probably love them. Unfortunately, foreign businessmen get a skewed view of reality from this, because often this affluent minority are the only people the businessmen come in contact with.

A solution to the problem of expensive receivers would be for governments, development agencies, etc to buy radios and put them in central locations such as schools. But this won't reach people in their homes.

Latin America presents a very different set of circumstances from Africa because there are thousands of radio stations in Latin America. Most towns have local stations already, and there is no need for direct satellite broadcasting and no reason for national governments to get involved in it, unlike Africa. Yet, Latin America is a major market for US, Japanese & European exports and the multinational corporations would appreciate the ease of buying ad time on just a few satellite stations which cover all of Latin America.

Latin American governments, however, might not look at this very favorably. Local products will

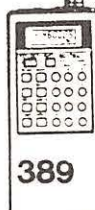
have a difficult time competing with Madison Avenue hype from the developed world. Just as important, these satellite stations would erode local customs and culture. They'll broadcast popular Spanish singers like Julio Iglesias - but not local performers from each country. On national holidays, there'll be no special programming, nor will the satellite stations be of much help during local natural disasters.

If I were the head of a country such as Honduras or Bolivia, I would ban the importation and sale of such direct satellite receivers on the grounds of preserving my national culture and protecting the local economy.

GALAXY ELECTRONICS

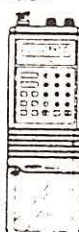
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A DXcellent Adventure!

Story and photos
by Karl Zuk



The rocky terrain provided an open band to overseas DX.

Here's a recipe for a legendary DXpedition: Take three expert DXers, add some superb receivers and home brew accessories, a few thousand feet of wire, and a splash of Aurora Borealis. Cook for three days and nights. Let your mouth water over their endless pages of loggings from Europe, South America, and the deepest corners of Africa. Then, enjoy hours and hours of exotic music and programming they have recorded on cassette. It's as tasty as a freshly baked apple pie!

Slowly, you begin to notice an unusual flavor. These programs were not intended to be heard by the outside world! Every station was heard on medium wave. Good old AM radio! What is the secret ingredient? Engineering expertise, highly advanced DX skill and strategy, and a little luck!

AM DX heaven can be found just south of St. John's, Newfoundland, Canada, near the charming little fishing villages of Cappahayden and Renew's. Rocky hills surround the area creating a natural shield greatly attenuating signals from Canada and the United States. Almost every frequency is open for possible foreign reception. The Atlantic Ocean also plays a major role. Medium wave transmissions travel much farther over salt water than land. It is a listening site that is truly a window to the world.

Remarkable people were required to achieve this amazing feat. The project was organized by Mark Connelly, an engineer for Raytheon. Professionally, Mark designs automatic testing equipment, employing artificial intelligence, to ensure the quality control of hundreds of different computer and RF circuit boards. In his spare time, Mark is an innovator and inventor of specialized equipment for the medium wave

DXer. Remotely tuned antennae, customized preamplifiers, and antenna phasing units that can manipulate long wires into powerful directional arrays, are only a sample of his design wizardry.

Dr. Jean Burnell and Neil Kazaross completed this team of experts. Kazaross was an electrical engineer, developing antenna designs for the last ten years. He recently jumped into a new career as a stock options trader. Dr. Burnell serves as a professor of chemistry at Memorial University in St. John's. An accomplished tropical band and medium wave DXer, Jean was instrumental to the success of the project. His initial research and scouting resulted in two nearly perfect sites. All three men have spent years combing medium wave frequencies for unusual foreign and domestic DX in this area of the world.



Left to right: Jean Burnell, Neil Kazaross, and Mark Connelly.

Preparation for the trip was similar to a scientific expedition. Exactly a month before the trek, Mark visited a site he believed had similar reception in Rockport, Massachusetts. Solar activity follows a cycle lasting 26 or 27 days, so this would be the last time he could notate reception conditions before the DXpedition began. Connelly created a guide of exactly what to look for and what might be expected.

Both Mark and Jean worked on selecting the hotel and the antenna sites. The DXpedition would take place between November 7 and 10, 1991, to take advantage of maximized reception without enduring extremely cold and rugged weather. Many lodgings were closed during the off-season, so choices were limited. Jean picked the place to stay after lengthy studies of hotel positioning, searches for noisy power lines and other interference sources, and open areas for antenna erection.

The area was quite rocky, without sandy beaches. Conifer forests filled with black spruce and balsam fir trees are interspersed with large meadows of brush. Many small fishing towns dot finger inlets throughout this picturesque wilderness.

Upon arrival to Newfoundland on Thursday, it became obvious that Mark and Jean's research had not been in vain. Reception conditions were quite auroral creating greatly enhanced reception to the south. Stations broadcasting from Northern Europe were almost nonexistent. "Just to show you what the aurora can do, Spanish stations with one kilowatt were roaring over German stations with 100 times that power," Connelly noted. African stations leaped out of the radio in Mark's rental car as he travelled from the airport to the hotel. Guinea was heard on 1404 kHz, Mauritania on 1349 kHz, Canary Islands on 1008 kHz, and Morocco, with one kilowatt, on 1080 kHz, along with many, many more.

Neil had arrived a few hours earlier and was met by Dr. Burnell at the airport. Their first stop was not at the hotel. They immediately travelled to a DX site near the lighthouse at Renew's, five miles from "The DX Inn" (Lawlor's Hospitality Home in Cappahayden). The antenna building began!

A type of antenna known as a Beverage or wave antenna was exclusively used during the DXpedition. Running over a thousand feet of wire in a straight line creates a very directional antenna with enormous power for medium wave reception. The longer the antenna, the tighter the pattern of pickup, with a proportional increase in gain. Four Beverages were eventually rolled out through the brush and scrubby forests.

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Shortwave Broadcasting

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ALBANIA (non?) Voice of the Young Albanians in Exile, Sundays at 1600-1700 on WWCR, 15690, reported that a new Albanian language station would soon appear on SW, Voice of Kosovo, or *Zeri I Kosvos*, perhaps Monday evenings, and planned to carry VOA and Exile program (Harry Riddell, *DX Ontario*)

ALGERIA Radio Algiers, 17745, English heard at 1725 to 1800, moved up from 1900 UTC? (Chuck Albertson, Seattle, *World of Radio*)

ANTARCTICA LRA36, Radio Nacional Arcangel San Gabriel, Base Esperanza, reactivated mid-November after long absence, 15476 weekdays at 2100-2305, multilingual IDs including English but programs in Spanish, *Horizontes de Hielo* and *Argentina Mi Pais*; 1 kW (Gabriel Ivan Barrera, Argentina, Radio Nederland *Radio-Enlace*, who phoned station after others had re-discovered it) 15475.7 variable heard from 2150 to 2203/2306 with pop music, IDs (Tim Flannery, Ont., *W.O.R.*) Asks for reports (Hugo Lopez, Chile, *Radio-Enlace*) Uses same trumpet sign-off and I.S. as nine years ago; frequency jumps 1 kHz, sometimes on 15474.74, other times on 15475.74 (Dario Monferini, Italy, with Henrik Klemetz, Sweden, and Juan Carlos Codina©, Peru, *W.O.R.*) Heard daily until 2259 on 15475.7 (Brian Alexander, PA)

AUSTRALIA Due to budget cuts, Radio Australia tried to cancel French broadcasts and Japanese transcriptions, but backed off after a strike which affected English broadcasts (Radio Netherlands, *Media Network*) About same time, programming was shuffled, with *Communicator* now Sundays 0530, 0930, 1330, Mondays 0730 (Wolfgang Bueschel, *WWH Weltschau*)

Revised schedule effective Dec. 8 shows Brandon 10 kW relays: 11720 at 1900-1100; 11880 at 2100-0800, 7240 at 0800-2100 (via Bueschel)

AUSTRIA Reports are wanted on reception quality of 9875 USB, to North America 0000-0300 including English at 0130-0200 (David Hermges, Radio Austria International)

AZERBAIJAN Baku on new 4760 ex-4785 going from Azeri news to Russian greetings at 0305 (Hans Johnson, MD, *W.O.R.*) Radio Baku on 18405, 3rd harmonic of 6135, at 1512 (Nikolai Rudnev, Russia, *World DX Club Contact*)

BOLIVIA 4552.44 now used regularly by Radiodifusoras Tropico, Trinidad, Beni, one day testing until 0030, to return at 1300 on "4550" (Juan Carlos Codina©, Lima, Peru, via Dario Monferini, *W.O.R.*)

BOTSWANA New VOA relay easily heard at 0430 when 11940 closes but 7265 continues; no local ID; also heard Xmas Day at 1805 on 30890, 2nd harmonic of 15445 -- note the *MT* MUF charts showed 37 MHz on this path.

BYELORUS At C.I.S. capital, will Radio Minsk become the behemoth Radio Moscow of the future? It has a long way to grow. External service, complete through February: 0030-0100 to America on 17690, 17605, 15180, 7400 (between Vilnius and Kiev); 2230-2300 to Europe on 6165, 5950; and the 1930-2000 broadcast to Europe on 7420, 6175, 6090, 6010 switches to German on Sunday, Wednesday, Saturday, with all the rest in Byelorussian (BBC Monitoring)

CAMBODIA (non?) Contrary to last month's report, Voice of Khmer retains separate program on 6325, strong at 1100-1400; not merged with Voice of National Army of Democratic Kampuchea, which moved to 5410 and reduced timing to 1200-1500; but Voice of Democratic Kampuchea (via China) was gone by Xmas (Victor Goonetilleke, Sri Lanka, *RNMN*)

CANADA Ontario DX Association has become QSL manager for CFRX, 6070; reports should be sent to ODXA, Box 161, Station A, Willowdale, Ont. M2N 5S8 (*DX Ontario*)

Not to be outdone, the Canadian International DX Club has volunteered to take over QSLing for Radio Canada International, which would have stopped any verification in 1992; no more do-it-yourself; full data cards with site will be issued from the usual RCI address (Sheldon Harvey, CIDX, *W.O.R.*)

The Coalition to Restore RCI continues its efforts; testified at government hearing in Ottawa, with hopeful response for eventual improvement (Sheldon Harvey, Montreal, *W.O.R.*)

CHINA China Huayi Broadcasting Co., 6185 also announces AM, FM, and 4830; one-hour programs were previewed as: *Express* at 1000 and 1500; *Paradise* at 1100 and 1400; *Music Hall* at 1200, 1700; *Service Counter* at 1300, 1600 (BBCM)

(non) Voice of China, via CBS Taiwan, is produced by Foundation for China in the XXI Century, Walnut Creek, CA, but announces this address: P.O. Box 79218, Hong Kong (Toru Yamashita, Radio Japan *DX Corner*)

COLOMBIA Radio Nueva Vida has 100 watts on 5565 (actually 5567.3 lately), at 1030-1330 and 2300-0200 from Tibu, cultural/religious programming, volunteer staff; address is A.A. 402, Cucuta (Rafael Rodriguez R., Colombia, *Pampas DXing*)

Radio Patria Libre, clandestine, is at 04-27-41 N, 72-58-51 W, very near Bogota (*Go-DX* via DXSF, via Mitch Sams, *Fine Tuning*) Announced it would have "international transmission" on 15th and final day of each month on 14950 at 2030-2050 and 0130-0150 (Yimber H. Gaviria, Colombia, *HCJB DX Partyline*) Nothing noted Dec. 31 at 2050 or Jan. 1 at 0130 (gh)

COSTA RICA To accommodate more programming, Radio for Peace International went to an 8-hour schedule Jan. 1, with a sesquicentennial. *FIRE* (feminist) programs are daily at 1600 in Spanish, 1700 English; *Outlaw for Peace*, weekdays 1800; *New Dimensions Radio*, Mons. 2200, Weds. 2000, Fris. 1830, Suns. 2000; *Sound Currents of the Earth*, Weds. 2200, Suns. 1830; *Radio New York International*, Sats. 1930-2130. *WORLD OF RADIO*: Sun. 2230, Tue. and Fri. 2000, Sat. 1830; *RFPI Mailbag* follows on Tue. and Sat. sometimes. Repeats 8 and in some cases 16 hours later. Full schedule available from RFPI, Box 10869, Eugene, OR 97440; please enclose contribution or return postage. Tune 21465 USB, 15030, and/or 7375 USB. (via Daryl Rocker, NY)

TIUCR, Radio Universidad, briefly reactivated 6105 in mid-October, and QSLed; heard as early as 2026, past 0201 with classical music (Terry Krueger, DXSF, via *Radio Nuevo Mundo*)

5119.70 with ranchera music, time in UTC-6 zone, IDs seemed to mention Venezuela at 1040 past 1140 (Chuck Bolland, FL) Most likely is rhyming Radio Alajuela here, fourth harmonic of 1280 (gh)

CROATIA unID on 6210 from around 2100, great signal as late as 0500 (Jerry Coatsworth, Merlin, Ont.) It's Hrvatski Radio, Zagreb, ex-7240, 0400 ID parallel 9830 (Hans Johnson, MD) 6209.9, with English news of war at 2205-2213, while 9830 only was heard with two minutes of English at 0707 and 0907 (Brian Alexander, PA) Schedule is 0600-1900 on 7240, 1900-0600 on 6210, and 24 hours on 9830 (BBCM)

(non) Another time for Radio Libertas, via WHRI, 7355, is 0921 going from English to Croatian (Mick Ogrizek, *Australian DX News*)

Radio Free Croatia via WHRI 7315 is scheduled at 0100 UTC Tue., Thu., Sat., but sometimes also appears Wed. or Fri. It takes a more militant stand than Croatian Radio Zagreb (John Mrvica, PA, *W.O.R.*)

CUBA RHC's 29th annual essay contest, for five trips to Cuba: "How has Radio Havana Cuba contributed to the process of unity and identity among the peoples of Latin America and the Caribbean?" Deadline April 30, to Box 6240 (via Kevin Klein, WI)

Shortwave Broadcasting

CZECHOSLOVAKIA At first unID, multi-lingual tourist program mornings such as 0830 on 6044.9 is Prague instead of 6055 ('BM', *Shortwave Bulletin*, Sweden)

(non?) New independent station in Prague, Hello World, has signed contract with CLT, Luxembourg, to start programming early February (Radio Czechoslovakia via BBCM)

ECUADOR A new AM & FM station is planned for Cuenca by Dept. of Culture; also applied for SW, Radio Zaracay has sold its SW 3395 to Radio Catolica, now including relays of Quito 5030 at 0100. Estero Zaracay has top rating in Quito via FM repeater. La Voz del Upano plans two new SW frequencies; Radio Nacional, Limon, not yet on 3370 (Richard McVicar, HCJB DXPL with info from Yimber H. Gaviria, and Govt. frequency office)

La Voz del Rio Tarqui, Cuenca, 3285, heard after six month absence, 0506 and 1120 (McVicar, HCJB)

Emisoras Progreso, Loja, have two transmitters used alternately on different frequencies (Dario Monferini, *Play-DX*) On 5058.84 at 0200-0315 (R. Puppo, Italy, *ibid.*) And a week later on 5062.79 at 0145-0215 (Giuseppe Zella, *ibid.*)

Hawaiian music is planned for *Music from the Mountains*, Sat., Feb. 8 at 1750 on HCJB 15270, 17790, 21455 to Mideast. North American at 0500-0700 on 11925 only (via John Carson, Diane Mauer) European at 0700-0830 moved to 9585.2 (Daryl Rocker, NY) Increasing crime and cost of living in Miami suburb Opa Locka persuaded HCJB to move away. Colorado Springs the ideal new HQ (Ron Cline, HCJB, via Rusty Serenberg) *Focus on the Family* also moving there, from Los Angeles; Springs courting evangelical megabucks? (Bill Dvorak, WI, *W.O.R.*)

GHANA News in English daily at 0600-0610 and 2245-2252 is on both GBC Radio One, 4915, and Two, 3366 (BBCM)

HONDURAS HRJA, Radio Copan Internacional, started testing on 9950 evenings in December; may also use IDs of FM parent Estereo Amistad; 1 kW transmitter to be replaced by 5 kW; does not have crystal for 15670 yet (Jeff White, Radio Miami International) When I checked around 0100, heard only India(?) on 9950, suddenly blocked by WYFR by mistake here instead of 9505 (gh)

IRAN VOIRI's new English to us at 0030 heard on 9720 instead of 9765 from 0024 past 0045, better on 9022 (Brian Alexander, PA)

Radio Zahedan, separate from Radio Teheran, has Urdu at 1530-1630 on 11930 (Alok Das Gupta, India, *ADXN*)

IRAQ Radio Baghdad's revived English broadcasts turned out to be in Arabic (Sheldon Harvey, *W.O.R.*; Bruce MacGibbon and Tom Sundstrom, *SW Echo* via Kirk Baxter)

(non) Voice of Rebellious Iraq, pro-Islamic revolution, and anti-Saddam, which began last March, is now heard at 0330-0700, 1130-1500, 1730-2000 on 7085 varying to 7050, all Arabic with news at 0630, 1420, 1930 (BBCM)

IRELAND Radio Dublin International, heard Sunday mornings since Dec. 1 on 6910.8 (Jerry Coatsworth, Ont.) Reactivated three years after police raid, 6910 Saturday 0700-0715 (Dario Monferini, Italy, *Play-DX*) Another Saturday at 0745-0915 on 6910.8, very weak (Brian Alexander, PA) May switch to 6930 (Allen Dean, *WDXC Contact*)

ISRAEL Kol Israel's resumption of overnight broadcasts, though not in English, can be traced to Jerusalem *Post* article stating that Radio Damascus was taking over those frequencies (Richard Krasna, NJ) No evidence this happened (BBCM) 7465 very good until abrupt cut at 0400; 9388 quite strong around 0500 for English news (Harry Bloomberg, PA, *SWL List* via Will Martin)

JAPAN Local mornings in January, NHK experiments with relaying domestic service at 2100-2400 on 17810, 11815, separate from General Service on 11820, 15195, 15430 (Radio Japan)

KASHMIR (non) Voice of Independent Kashmir has new transmitter in Rawalpindi, Pakistan on 6300, for an hour at 0230, 1100, 1430, with USB plus carrier, also on 5000; also announces 1630 on both plus 5900, but not traced (Kanwarjit Sandhu, Punjab, *RN Radio Network*) Press Trust of India reported Pakistan set up anti-Indian station. Apparently refers to Voice of Kashmir Freedom, same times as above plus 0700, same frequencies, in Urdu, Kashmiri and English; not always in parallel (BBCM) Something like this heard 0252-0257 sign-off when WWV was weak on 5000 (Dan Hanington and Gary Heraldi, Ont., via Rob Ross, via George Zeller, *ACE*)

KURDISTAN (non?) Voice of the People of Kurdistan, in Kurdish/Arabic/Turkman on 7075 varying 7050-7080, and 3930 varying to 3960, 0400-0600, 1500-1720; check 15060v too (BBCM)

LITHUANIA Radio Vilnius moved back into its previous premises, Dec. 17, evicted by military force the previous Jan. 13 (BBCM) And resumed old interval signal (*Signals*) Radio Centras, 9710, the last Saturday of every month at 0700 in English, 0740 in German, 0750-0800 in Esperanto (Radio Vilnius via BBCM)

NETHERLANDS ANTILLES TWR has a special Columbus 4-part QSL for 1992; get the 4"x9" card during the first quarter; then one ship sticker each quarter to be attached. Reports must cover at least 15 minutes and quote frequency within 50 kHz (*Bonaire Wavelengths*)

NEW ZEALAND The much-publicized radio tour during February was cancelled due to insufficient bookings. QSLs show date and frequency only; please do not return asking for full data (Tony King, RNZI Mailbox) Time for switching 17770 to 9700 has moved from 0630 to 0758 (Chuck Albertson, WA, *W.O.R.*)

NICARAGUA Former Contra frequency 5560 reactivated, testing 0052 past 0131 from the UTC-6 zone, asking for reports from Atlantic coast Juan Carlos Codina@, Peru, via Dario Monferini) Subsequently, Radio Miskut, Puerto Cabezas heard on and announcing 4560 at 0300-0600 (Peter Osterholm, CA, via Henrik Klemetz, via Monferini)

Another Puerto Cabezas station, Radio _____ Musical tested 4870 before Xmas until 0145 (Rocco Cotroneo, NY, via Giuseppe Zella, Italy, via Monferini)

NIGERIA Radio Nigeria, 4990, has news from the new capital Abuja, at 0600, 1500, and 2100, apparently phone-feed to the usual transmitter site (BBCM)

OMAN BBC is installing better antennas for South Asia, later hopes to replace 100 kW with 300 kW transmitters (BBC *Waveguide*)

PAKISTAN Radio Pakistan, English at 0800-0845 and 1100-1120, Urdu in between, on 21520 and 17902.5 (BBCM) From Karachi and Islamabad sites respectively (Austria's *DX Telegramm*)

PAPUA NEW GUINEA (non?) Radio Pacific, 15040, announcer Mickey Barracuda, on Boxing Day 0100 past 0200; address P.O. Box 3474, Boroko (Patrick McDonald, NSW, *RNMN*)

DX LISTENING DIGEST

— much more info in the style of this column.
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Shortwave Broadcasting

PERU 4300.00, Estacion Pucara, in Pucara, Jaen, Cajamarca, at 2340, also uses slogan "Radio Naylamp." 4382.97, Radio El Sol, Juliaca, mix of SW 3230.19 and MW which must be 1152.78, at 0207 and 2315-0130. 4438.0, Radio Lider, Cuzco area, may be harmonic, or repeater of FM outlet, sounds official, not tester. 5305.45, Radio Ruder, closing at 0001 or 0015 on 5305.49; maybe same owner as Pucara. 6380.81, radio San Miguel, in Ilave, capital of new province Collao, in Puno Dept., giving 6300, from 0025 to closing 0300 with a newshour at 0100; not in Huanchac as in *WRTH* 91. 6803.21, new station Radio Ondas del Mayo (a river), Nuevo Cajamarca, inaugural broadcast got more and more soused until 0530 sign-off (Juan Carlos Codina©, Lima, Peru, via Dario Monferini, *Play-DX*)

Radio America seems back on regular schedule, 6011.16 to 6011.11 at 1100 and 1005 (Chuck Bolland, FL)

POLAND Radio Polonia planned to change its name back to Polish Radio Warsaw, in mid-January, now a public radio station rather than government (Frank F. Orcutt, NY, *W.O.R.*)

RUSSIA In December, Vasily Strelnikov found his *Weekend* program censored, and then canceled by Radio Moscow World Service. "Something's cooking; my impression is that glasnost is on its way out." A week later: "I'm out of here, for the last time." (RNMN) RMWS did continue under that name in 1992 (gh) External service may be taken over by Radio Russia (George Jacobs, RNMN and Ian McFarland, Radio Japan *DX Corner*) It has been decided that the RMWS in Russian language is replaced by Russia's Radio (Pavel Mikhaylov, RMWS *DX Klub* via BBCM) Some of the higher winter daytime frequencies for R.R. are 16330-USB, 15365, 12045; at night, 7355, 6040, 5290. Mondays at 1810 there is a religious program, *I Believe* (BBCM)

Ekho Moskv, Radio EM, is on 6035 only, 0400-0700, 1700-2200, but weekends also from 1600, and Fridays until 0300 (BBCM) UTC Saturdays?

SAUDI ARABIA BSKSA testing in Arabic on 26100, powerful 1331 past 1400 on Oct. 26 (Alan Roberts and Sheldon Harvey, PQ, *CIDX Messenger*) Anyone heard it since?

SOUTH AFRICA Capital Radio, Transkei, reactivated on 3926.0, 1800-2200 except Sundays to 2300, and opening at 0400; daytime as usual on 7 MHz band (Vashek Korzinek, RSA, via Dario Monferini, *W.O.R.*)

SUDAN (non) Radio SPLA, in English and Arabic at 1300-1400 on 11710 for a while, more recently went back to 9550; also multilingual at 1100-1200, and unconfirmed at 0400-0500 (BBCM)

SWITZERLAND Two 30 kW Schwarzenburg transmitters formerly used for SSB tests and which would now be inactive, have been put into the RTTY experimental broadcasts, one hour at 1830 on 17530; 2000, 0030 and 0200 on 10515; English added at 2000, and for new broadcast at 1700 on 15835. Audio FSK, two tones on USB, 170 Hz shift, 50 baud, FEC capable but not used. Will try sending QSLs via RTTY itself, after advance notice to recipients (Two Bobs, *Swiss SW Merry-Go-Round*)

SYRIA Damascus general domestic program, 0500-1100 on 12085, 1100-1700 on 15095, 12085, 1700-1900 on 12085, includes program for Golan Heights, daily except Fri. 1350-1410; and Voice of Palestine daily 1630-1730, an hour later during Ramadan (BBCM)

TAIWAN Anti-Kuomintang Voice of Taiwan, 1159-1359 on 9990, announced plans to set-up TV station (BBCM)

TAJIKISTAN Dushanbe on new 6515 at 0030-0115, parallel 4635 (Hans Johnson, MD, *W.O.R.*)

THAILAND BBC are trying to develop new facility here, MW and one-hop SW (*Waveguide*)

TOGO In early December, Radio Kara, 3222, was taken over by revolutionary forces, heard at 0529-0900, 1630-2304 (BBCM)

UKRAINE Radio Kiev's English hour on 4825 changed from 0230 to 0245, then to start at 0215 (Bill Matthews, Radio Korea SW *Feedback*) Not same program as to North America. (RNMN)

USA WJCR World Wide will soon be going on the air on 7485, 7540, 15660, 15675--prayer, Bible teachings, and music (Don Powell, *Prayer Line*, Upton, KY, via Diane Mauer, WI) First rebuilt RCA 50 kW AM transmitter from Armstrong in Syracuse was due in January; other construction underway, including swiftly-erected rhombic instead of corner reflector, and could be on the air by late January or February. If satisfied with transmitter, may get three more (Gary at WJCR via *World of Radio*)

Nothing is definite yet, but KJES may have some definite plans by mid-March. It was only on the air for about 12 hours of testing (Richard M. Thomas, TX, *W.O.R.*)

WEWN, new shortwave station near Birmingham, AL, of Eternal Word Television Network, has ordered four 500 kW Continentals; first should be ready to test by October, second operational by Xmas '92, project complete by March 1993 (George Jacobs, RNMN) The 500 kW transmitter is computer-controlled with 400-frequency capability. WEWN site is very hilly, construction difficult, roads with sharp turns. Back lobe directly hits transmitter building (George McClintock, TN)

Radio Miami International finally got a construction permit from the FCC on Dec. 16, with a sesquieu-year deadline for 50 kW, but should be on much sooner. Meanwhile, RMI continues via WWCR, WRNO, and WHRI. Consolidated weekday schedule is: 2300 *Lo Nuestro* (by people from Spain) on 7355; 0005 *Esperanza* on 7435; 0100 *Radio Conciencia* on 7355; 0200 *Rumbo a la Libertad* on 7355; 0300 *La Voz de Alpha 66* on 7355; 0400-0430 *Movimiento 30 de Noviembre* on 7395; Sundays into UTC Mondays: 2315 *Alternativa* on 15690; 2330 *Pueblo Libre* on 15690; 0100 *La Voz de Tribuna Libre* on 7435; 0200 *Radio Voluntad Democratica* on 7435; 0300 *Radio Periodico Panamericano* on 7355; 0400-0459 *Un Solo Pueblo* on 7395. RMI now has its own QSL card from P.O. Box 526852, Miami, FL 33152. Now expanding into Saturday on WRNO, with *Emission Pirata* by the *Lo Nuestro* group, 2300-2400 on 7355, but may run later if sports require, and once aired at 0030 UTC Sunday delaying *World of Radio* until 0130-0200 (Jeff White, RMI)

WTVN, 610, Columbus, OH, heard via remote cueing NBFM on about 26255 at 2015 (Tim Hendel, FL)



VOA Delano, "gray patch," has seven 250 kW AM, two 50 kW ISB. A phased-array antenna enhances south-bound signals; is approximately 1100 feet long, 440 feet high (Richard LaDieu, AFGE Local 1812 *News & Views*)

See last month; additional time for WORLD OF RADIO on WWCR is Monday 2200 UTC on 15690 and see also COSTA RICA. Before the Friday 2300 airing on 12160 is a Mid-east or Albanian program; after it, a white racist, anti-semitic show from WV. WWCR went down to 5935 for Gene Scott overnight. *Crossband* moved back into Radio New York International block, every UTC Monday 0200-0230 or later on 7435.

VATICAN Better reception than the 0250 North American service are: 0500-0530 on 11625, 9695; 0600-0620 on 7250, 6245; 0630-0700 on 9695 (John Norfolk, OK, *W.O.R.*)

VENEZUELA Radio Rumbos, 4970.5, sign-off at 0600 in English and Portuguese, S1 for details (Ron Young, England, *BDXC Communication*)

VIETNAM Gia Lai-Kon Tum on 4787 at 1130-1215 in three local languages (Isao Ugusa, Japan, *NHK DX Corner*)

YUGOSLAVIA RY revised English to: 2200-2230 on 6100, 9505; 0130-0200 and 0230-0300 on 9580 (John Mrvica & Joe Hanlon) And still 1230-1300 on 17740 (gh)

Broadcast Loggings

Thanks to our contributors -- Have you sent in YOUR logs?
Send to **Gayle Van Horn**, c/o Monitoring Times.
English broadcast unless otherwise noted.

0003 UTC on 11735

YUGOSLAVIA: Radio Yugoslavia. National Yugoslav news, into comments on the future of their nation. Easy-listening music selections. (John Carson, Norman, OK)

0040 UTC on 11715

MALE: Radio Beijing relay. *Learn Chinese* program conducting a dialog in a grocery store. (Bob Fraser, Cohasset, MA) (John Simmons, San Antonio, TX)

0055 UTC on 6020

NETHERLANDS: Radio Netherlands. *Media Network* talks on FM broadcasting in Europe. Parallel frequency 15560 USB noted with excellent quality. Review of the Drake R-8, and *Propagation Report* heard on 13770 kHz at 1510 UTC. (Rose Carmine, Sidney, OH) (W.A. Jenkins, Saratoga, FL)

0100 UTC on 9575

ITALY: RAI. International news, and comments on American soap operas. Station ID and address. Parallel frequency 11800 kHz noted at this time with classical music. Station sign-off at 0120 UTC. (Ron Pratt, Oak Harbor, WA) Fraser, MA) (Carmine, OH) (Carson, OK) (Sam Wright, Biloxi, MS)

0115 UTC on 9022

IRAN: Voice of the Islamic Rep. of Iran. English/Farsi. Announced as the "North American Service from 0030 to 0130 UTC." Parallel frequency quotes of 15260//9765 kHz. *Listener's Special* program and closing recitations in Farsi. Tehran address given with station ID. (Ken Loh, Santa Barbara, CA) (Randall Morrison, Tullahoma, TN)

0120 UTC on 7345

CZECHOSLOVAKIA: Radio Prague Int'l. Music program in progress at tune-in. Program sign-off at 0128 UTC. *Stamp Corner* program noted on 5930//7345 kHz at 0320 UTC. Folk tunes to sign-off at 0329 UTC. (Jeff Leach, Omaha, NE) Additional monitoring at 2200 UTC on 9605 UTC, with news, "DX Special", and feature on Czech literature. (Nicholas P. Adams, Newark, NJ)

0127 UTC on 11730

USSR: Radio Moscow. Closing comments on *Focus on Asia and The Pacific*. News briefs and interview with an American congressman. Additional programming noted as follows: 0249 UTC on 17665 kHz/0431 UTC on 9600 kHz/ and 1418 UTC on 9755 kHz. (Carson, OK) Russian programming audible on 21460 kHz at 1500-1600 UTC. (Stewart Todd Morgan, Raleigh, NC) *Science and Engineering* heard on 15425 kHz at 2325 UTC. News briefs at 2330 UTC. (Brian Schaft, Berea, OH)

0200 UTC on 7355

UNITED STATES: WRNO. Commercials for the Trump Plaza, into *Let's Talk Sports*. Pete Bergeron's cajun music show at 0230 UTC and New Orleans jazz tunes. (Carmine, OH)

0201 UTC on 11705

SWEDEN: Radio Sweden. *Mailbag* program discusses the pros and cons of 60 Degrees North. (Carson, OK) Additional monitoring on 9695 kHz at 0340 UTC, Swedish sex therapist being interviewed. Review on Swedish rock and pop CDs. (Carson, OK) (Carmine, OH)

0210 UTC on 11910

HUNGARY: Radio Budapest. Political system of Hungary discussed. Station ID and Hungarian folk tunes. Listener's mail featured on *What You Say* show, noted on parallel 9835 kHz at 0220 UTC. (Brian Dougherty, Harrisburg, PA)

0220 UTC on 17730

BRAZIL: Swiss Radio Int'l relay. Feature on the aqueduct system in Switzerland. Swiss folk music to Spanish service at 0230 UTC. (Frank Hillton, Charleston, SC)

0240 UTC on 7375 USB

COSTA RICA: Radio For Peace Int'l. *World of Radio* program and James Latham with *Mailbag* show. (Hillton, SC)

0245 UTC on 9705

PORTUGAL: Radio Portugal. Report on tourism in Portugal, and station ID. Pop vocals to tune-out. Additional monitoring on 9555 kHz. Folk music to station sign-off with national anthem at 0300 UTC. (Hillton, SC)

0315 UTC on 11720

BULGARIA: Radio Sofia. News on continued conflicts in Yugoslavia. Commentary at 0316 on trade unions and the nation's unemployment crisis. (Carson, OK)

0315 UTC on 11715

CHINA: Radio Beijing. Chinese holidays discussed with good signal quality. China's "oldest profession" discussed at 0430 UTC on 11840 kHz. (Carson, OK) (Leach, NE)

0335 UTC on 9540

VENEZUELA: Radio Nacional de Venezuela. English/French. Frequency quote and QSL address in English. Interval signal and French service with international news. (Hillton, SC) Station audible on 9540 kHz at 0030 UTC. (Adams, NJ)

0345 UTC on 9870

CANADA: Radio Austria Int'l relay. Interesting discussion on the election system in Austria. (Brian Bagwell, St. Louis, MO) (Wright, MS)

0400 UTC on 11940

ROMANIA: Radio Romania Int'l. News and editorial on Romania. Report from Moscow and national sports report. Station sign-off at 0428 UTC. (Bagwell, MO)

0420 UTC on 9670

GERMANY: Deutsche Welle. Station IDs and frequency quote to roundup of national economic news. (Marty Rubinstein, Santa Barbara, CA)

0429 UTC on 6009.9

MEXICO: Radio Mil. Spanish. Several tunes of Spanish vocal pops. Station IDs and commercial for Ford Autocraft. (Carson, OK) (Mike Hardester, Jacksonville, NC)

0430 UTC on 11760

CUBA: Radio Havana. Interview with American journalist Devon Martin. (Rubinstein, CA) Additional monitoring noted on 17705 kHz at 2028 UTC with news updates. (Ed.) *Musica de la Cuba* noted on 9505 kHz at 1255 UTC, and *Dateline Havana* monitored on 11950 kHz at 0115 UTC. (Bob Fraser, Cohasset, MA)

1128 UTC on 9977

NORTH KOREA: Radio Pyongyang. Editorial on North Korea's relations with Japan. Musical tune *The Cradle of Happiness*, extolling the "motherly" Communist Party and Kim Il. Station sign-off at 1147 UTC. (Robert E. Tucker, Savannah, GA) (F. Jaffee, Creston, KY)

1135 UTC on 11815

NETHERLANDS ANTILLES: Trans World Radio. World news and sports report. *Morning Sounds* at 1143 UTC. Audible on 15345 kHz at 1200 UTC character spotlight on Queen Victoria. (Carson, OK) (Jaffee, KY) (Wright, MS)

1152 UTC on 9700

NEW ZEALAND: Radio New Zealand. Weekend broadcast to Japan. Programming included IDs, New Zealand's national news, and weather. Station sign-off at 1206 UTC. (Tucker, GA)

1259 UTC on 15470

USSR: Radio Moscow-Dushanbe. Interval signal and station sign-on. News on the USSR, announcer chat, and easy-listening tunes. (Carson, OK)

1300 UTC on 6005

CANADA: CFCX. CBC news and item on pollution killing the frog and lizard population. Noted new station ID as, "Country 600, CIQC", while shortwave remains CFCX. (Fraser, MA)

1305 UTC on 9750

SOUTH KOREA: Radio Korea. International news, and editorial on the two Korea's reunification. Asian pop style music and station ID. (Eric Stutler, Hot Springs, AR) Audible on 15575 kHz at 2358 UTC. Programming included, sign-on, news, and *Seoul Calling*. (Adams, NJ)

1310 UTC on 9515

UNITED KINGDOM: BBC. World Service newscast. (Tucker, GA) BBC features audible on 5975 UTC at 0435 UTC. (Wright, MS) *Seeing Stars* program heard on 9915 kHz at 2215 UTC, with featured comments on the Pleiades constellation, and the theory that Mayans were interested in astronomy. (Fraser, MA)

1313 UTC on 9580

AUSTRALIA: Radio Australia. Sports report on the annual Adelaide Grand Prix being rained out for the third straight year! Station ID and continued news. Additional monitoring on 13605 kHz at 1550 UTC, with world news, sports, and pop style music. (Fraser, MA)

1325 UTC on 21810

BELGIUM: B.R.T. Station ID and discussion on women's role in Belgium politics and business. (Stutler, AR)

1335 UTC on 15400

FINLAND: Radio Finland. *Northern Report* features banking and finance problems in Finland. Report on labor disputes in Estonia. (Earl Bailey, Oakland, CA)

1600 UTC on 17800

UNITED STATES: Voice of America-Bethany. Sign-on to VOA's African programming. European service audible on 17705 kHz at 1630 UTC, with national news, pop music, and VOA features. (Carson, OK)

2054 UTC on 15095

SYRIA: Syrian Broadcasting Service. Arabic music to station identification and international news. (Tucker, GA)

2138 UTC on 9900

EGYPT: Radio Cairo. National news and commentary on Mideast peace prospects. Arabic music and report on the Arab world's largest library. *Cairo Magazine* interviewing former Minister Ghali on Africa's role in the post cold-war world. (Tucker, GA)

2300 UTC on 11790

LITHUANIA: Radio Vilnius. Station sign-on with national anthem, into national news of Lithuania. (Carson, OK)

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State Department Radio Changes

Most of you who have followed this column over the years know that I love a good mystery. Well, I got one of my famed white anonymous envelopes recently containing a discussion of one of shortwave's long-running mysteries. Even more interesting is the mail I've been receiving from several of you out there (all of whom wanted to remain anonymous) who have been looking at the same thing I have been analyzing for some time. Consequently, here is a report on the so-called State Department Radio—the KKN50 stations, et al.

These stations are the ones who send endless QRA markers via CW in the HF band. They have for years been referred to in the hobby press as State Department radio communications stations. In fact, several listeners over the years have even reported receiving QSL cards for reception of these stations from the State Department.

Mystery solved, yes? Don't jump to conclusions, folks. I am not totally convinced these stations belong to the Department of State. The State Department might use some of this network's capability for backup or some such, but I think they do serve other users.

Look at it this way: Why would the State Department in this day of high speed secure computer communication and satellites use such an antiquated communications system? One monitor even reported hearing KKN50 one time using tone modulated CW instead of pure CW. I will ask the same question that he did, "Why on earth would what is supposedly an embassy communications station use such a grotesquely inefficient method of communications?"

You might remember that several years ago one of the transmit locations for this network was found by an MT reader at a number station transmit site, Warrington/Remington, VA, about 50 miles southwest of Washington, DC. KKN50 was found to be broadcasting from the exact same site. Another location was uncovered in this magazine in April 1989 by Al Zilman. KKN39 was found to exist in Miami where the transmitter and receiver sites are separated by about 15 miles. The editor of *Monitoring Times* and her husband also photographed the site.

So what is the mystery then? Well, let's take a look in depth at this so-called State Department Radio network and how it operates. I think one of our listeners (Ole Cornpone in North Carolina) puts it in perspective when he says:

"A couple of years ago, I got fed up with those mysterious Department of State markers and decided to learn as much about them as I could. I have over 30 receiver memories dedicated to these stations and spend a lot of time listening to them while I clean my fingernails, answer QSL cards, and read back issues of *Monitoring Times*."

Here is some background from Ole Cornpone:

The control stations (the guys who send the markers) each have a set of frequencies "assigned" to them (see chart on next page). They pretty well stick to these frequencies so that outstations (embassies, consulates, operatives, Marine Colonels, etc.) will know where to find them. At any given time they will simultaneously key some or all of their target areas.

The endless QRA markers give the outstations a chance to select the best frequency before calling. The markers consist of: 'QRA' (The call of this station is) 'DE' (Call Sign) 'QXX' (I will listen on...) followed by a group of numbers (i.e. 3/13/17) indicating the range of MHz frequencies on which the control station is listening/transmitting.

Until recently, KKN50 used channel numbers rather than megahertz frequencies, but apparently they have given up the practice. KWK95, a time-to-time control station on 11142 kHz, sends only "DE KWK95" as a marker.

Back in November of 1990, KWL90 began to include 24 in their QXX list at times. A 24 MHz frequency had not been previously listed in any of the major utility frequency list or databases. One evening, while the band was essentially dead except to Asia, KWL90's new 24 MHz frequency was found on 24827 kHz.

Yet another oddity regarding markers sent from these stations comes from KRH50. That station sends its QXX list twice. It has been noted that KRH50 also misses a lot of calls (too many tea breaks?).

Outstations in this network call the control stations mostly for the purpose of establishing a pair of frequencies to be used for duplex encrypted transmissions. The frequencies to be used are transmitted in the clear. You can hear the encrypted transmissions, but don't expect to learn anything because of the encryption. The transmissions sound like a loud rushing noise with an embedded buzz (sorry, that's the best description I can give). To date no CW has been heard on encrypted frequencies.

While the encrypted stuff is going on, the control station may call the outstation (or vice-versa) on the original CW frequency if problems arise on the crypto frequencies.

Occasionally, you may hear a brief CW QSO for signal checks or to haggle about message numbers. There is no personal chit-chat that anyone has ever heard on these frequencies. The contacts between stations are almost all in hand-sent Morse code, and these guys are not going to win any prizes for their fist. One recent and welcome trend is that they seem to be replacing their old straight keys with either keyers or keyboards.

From time to time, a few outstation-to-outstation conversations have been logged on these frequencies, but they don't seem to occur very often. I have also seen indications that a couple of outstations carry on conversations on non-control station frequencies.

Occasionally, a control station will make brief guest appearances on another control station's frequency, but only to make a quick contact. For instance, KKN50 has been heard working KNA27 on 13387 kHz—normally a KKN39 frequency. Monitors have also reported KWS78 coming up on a KRH50 frequency to QSO him and arrange a pair of frequencies for crypto work.

It is believed that all of the control stations have a direct link (satellite, wire or microwave) with KKN50 as I have heard requests to all of the control stations at one time or another to QSP (relay) to KKN50. Also, I heard KKN50 tell KNA27 (on 16363) to QSO KKN39. KKN39 (on 13387) immediately began calling KNA27 who didn't show up until several minutes later. KKN50 must have told KKN39 to expect him!

All sorts of strange howls, growls, and toots show up on these frequencies. I feel sure these are connected with the Department of State operations, because they will appear simultaneously on several of the frequencies used by a given control station. One of the more common signals associated with this network appears to be some sort of alerting signal. It sounds somewhat like the SELCAL tones heard on HF air traffic control frequencies. It is generally transmitted for a long time (5 to 10 minutes) with a repetition of a short sequence of tones of various frequencies and durations. Sometimes these tones are alternated with a marker in which the control station replaces its QRA marker with a call to a specific station (or to a net call sign).

It appears that the control stations, on rare occasions, use what could be construed as net call signs when they wish to contact multiple outstations. Monitors have heard KRH50 replace their QRA marker for long periods with calls to KRH48, and KWS78 has done the same using KWN98 or KWN94. This has occurred during time periods when the network appears to have a lot of activity. These net markers also contain what appears to be short bits of information, such as "QBM KKN50 ZZN3 ZZT4." For instance, as this was being written, KWS78 had been marking all evening with "KWN94 DE KWS78 ZZK ZZH K" and from time to time sending one of the above mentioned SELCAL transmissions for about 5 minutes.

The Mystery Deepens

Sometimes during the period from approximately 5 minutes before until 10 minutes after the hour, each of the control stations will suddenly break into a sloppy hand-sent version of the QRA marker. Sometimes the automatic Morse QRA marker is abruptly interrupted in mid-stream to allow the hand-sent code. Do the control operators just want the others in the net to know they are still alive and well?

All of this appears to have something to do with the NCS (National Communications System) if you believe the signs at the Warrenton/Remington and Miami sites. Enthusiasts who decide to go snooping might use this as a key to unlock other sites known to be in the system.

These stations seem to have both a transmitter site and receiving sites associated with their broadcast, if KKN50 and KKN39 are any indication. Anyone checking out other possible locations should be looking for both of these entities.

Frankly, an honest, hardworking Utility World freak has to be nuts (I am) to spend his or her precious time monitoring these folks, considering the minimal amount of information that can be learned. However, if you have some extra memories in your receiver and want to convince yourself that these stations do something other than send QRA markers, you might want to load up all the frequencies given in this column. Put all the frequencies for a given control station in contiguous memory positions so that you can quickly check for calls on each frequency when a QRA marker ends. You should also keep this thought in mind: These QRA markers are not sent continuously. There are periods of silence for monitoring purposes. If you don't hear the marker right away, just wait a bit and you will be rewarded with that treasured QRA marker, or better yet, two stations in QSO.

You will find more activity on weekday mornings (when most folks are at the salt mines) than in the evenings or on weekends. Also, when big international events occur, you may find a flurry of activity. In early November 1990, when President Bush announced the doubling of Desert Shield forces, there were several days of frantic activity on all of the network frequencies. When the actual shooting started, again these frequencies were hopping.

Some interesting events have happened recently to help pin down some locations within this network over the last year or two. The revolution in Liberia and the evacuation of US personnel appear to have brought about the demise of station KKN44 in the summer of 1990. Contrary to other hobby magazine reports, this revolution and the station's disappearance occurred almost simultaneously; therefore, the location of KKN44 must have been in Liberia. Listeners might still do well to keep KKN44's frequencies in their receiver memories as there has been some outstation activity on these frequencies since KKN44 went off the air. Outstation traffic on the old KKN44 frequencies became especially active during the Baltic troubles last year.

The volcano eruption in the Philippines seems to have aided in the close down of KWL90. KWA80 now uses KWL90's frequencies and appears to also be located somewhere in the Far East. Since Clark AFB has closed, I think it is safe to conclude that the broadcasts originated from that area. The transmitters were probably located at Camp O'Donnell on

Luzon with the receiving site located at Dau. I also think it is safe to say that the new location for station KWA80 is probably on the islands of Guam or Okinawa.

Over the years, much speculation as to the location of KRH50 has appeared in the hobby press. I have several monitors that have confirmed my suspicions that KRH50 broadcasts have originated from the RAF Barford St. John. The receiver site is probably located at Croughton RAF/AFB.

KWS78 in Greece might be found at several sites. These could include: Hellenikon AB in Athens; Iraklion AB near Gournia Crete; the Naval Communications facility at Kato Souli, Mt. Hortiatas, Mt. Parnis, or Nea Makri. I tend to lean toward Kato Souli (transmitter site) and Nea Makri (receiver site).

KKN39 has added a new frequency for QRA marking, 25545. Also KKN50 has added 15970.5, apparently dropping 16363 in the process.

The following is a list of frequencies used regularly by the DOS network for QRA markers, and for initial contact with other stations. Our frequency guide to the Department of State network lists all of the current CW frequencies in use.

Call	Location	Frequencies Used
KKN39	Miami, Florida	4956.5 13387 17413.5 25545
KKN50	Washington, DC (Warrenton/Remington, VA)	6925.5 10637 12022.5 15970.5 18525 23975
KRH50	London, England	5426 7724 11142 13815 16458 20568
KWS78	Athens, Greece	3186 4910 7627 10255 14360 18351 23642
KWA80	Far East	5443 7662 10464 12210 14616 17552 24827
KTR71	???	7724 - Sends "DE KTR71" only. Rarely heard.
KWK95	Cairo, Egypt	11142 - Sends "DE KWK95" only. Infrequent.
KWA43	???	10255 - Sends "DE KWA43" only. Heard once.

As I mentioned earlier, the old frequencies used by KKN44 still bear watching. They were 4886, 7652, 11474, 17404 and 23425.

Over the years, I have often wondered what these sites could be used for other than diplomatic traffic. One thought that recently crossed my mind has to do with single letter HF beacons.

Some of you remember that in the early days we had all sorts of these beacons popping up all over the spectrum. These beacons, as I reported in the December 1990 column, belonged to the U.S. Army Signal Intelligence Corps.

There were two purposes for this network of Single Letter HF CW beacons: propagation and signal intelligence traffic. Some sources indicated that the US abandoned its HF operation in favor of satellites for passing signal analysis traffic. Well now, I wonder: did they, or did just the cover change? Could the "second generation" system that the Army Signal Corps went to be the KKN type stations we are hearing today?

The Army Security Group has already been associated with both sites at Warrenton and Miami. Since the US Air Force Securities and Electronics Command and the Army Security Group, and the Navy Security Group have all been associated with other possible KKN sites, we might be looking at an overall operation under the National Security Agency umbrella.

I still don't have the hard evidence yet to tie this all together; therefore, some of this is still conjecture. However, it seems evident that the apparent demise of the Soviet Union and the Eastern Bloc hasn't put a dent into this network operation. With the help of some folks on the ground at other potential locations, we might solve some of the remaining questions. I hope to hear from a few of you on this, so be sure to report your findings to me via the address in the masthead.

Also, many thanks to Ole Compone in NC and DJ in Tennessee. Now only time will tell. And now, speaking of time, it is time to check out what you have been hearing this last month in the Utility World.

Utility Loggings

Abbreviations used in this column

AFB	Air Force Base	GCCS	Global Command and Control System
AM	Amplitude Modulation	HF	High Frequency
ASCII	American Standard Code II	ID	Identification
CANFORCE	Canadian Forces	M/V	Motor Vessel
CAP	Civil Air Patrol	Ops	Operations
CG	Coast Guard	RTTY	Radioteletype
COE	Corp of Engineers	SAR	Search and Rescue
COMSTA	Communications Station	SALCAL	Selective Calling
CQ	CW general call for any station	SITOR-A	FEC Data Mode
CW	Continuous Wave	SLHFB	Single Letter HF Beacon
DE	French word means 'From'	Unclass	Unclassified
DOT	Department of Transportation	Unid	Unidentified
EAM	Emergency Action Message	US	United States
FAA	Federal Aviation Administration	USB	Upper Side Band
FEMA	Federal Emergency Management Agency	USCG	United States Coast Guard

All frequencies in kilohertz (kHz), all times in UTC. All voice transmissions in English unless otherwise noted.

- 410.0 LALF2-M/V El Delantero with DF activities in CW at 1000. (Ary Boender-Netherlands)
- 425.0 UIYT-M/V Vyshgorod giving ETA to Weser light vessel in CW at 1115. (Boender-Netherlands)
- 454.0 SPXR-M/V Jelcz 2 with message to Zerssen Brunsbuttel in CW at 1003. (Boender-Netherlands)
- 468.0 DDMM-CGM Roussillon calling OST in CW at 1025. (Boender-Netherlands)
- 480.0 VRGL-M/V Elso calling DAN with a message in CW at 0954. (Boender-Netherlands)
- 512.0 SXNM-M/V-Aghios Makarios with a message to Elbe pilot in CW at 1015.
UGRC-M/V Otepya with messages in CW at 2040.
SWUZ-M/V Atlantic Statesman calling PCH in CW at 0835.
P3WA-M/V Mona Lisa calling OST in CW at 0840.
P3QS2-M/V Priamos calling DAN in CW at 0852.
3FGU-M/V Baltic Star calling GNF in CW at 0903.
WRYG-M/V Mosac Ranger calling GNF in CW at 0904.
P3LX-M/V Fisher calling GLD in CW at 0907.
VRGL-M/V Elso calling DAN in CW at 0943.
UZVD-M/V Capetan Skorniakov calling LGQ in CW at 1137.
C6CS7-M/V Puhos calling FFB in CW at 1610.
UNVS-M/V Krasnoie Selo calling FFB in CW at 1719.
VROR-M/V Andes calling DAN in CW at 1725. (Boender-Netherlands)
- 2694.0 USCG Group Moriches and Long Island Sound Group, NY working CG 44405 with a SAR case communications at 2331. Also used 3253 in USB (District 1 Ops frequency). (Bill Battles-NH)
- 3925.0 Spanish female 5-digit number station in AM at 0309. (Miguel Angel Reyes-Morelia, MI)
- 4232.0 FUF-French Naval Radio, Martinique with CW V marker at 0022. (Bob Pettengill-Washington, DC)
- 4350.0 TBB5-Ankara Naval Radio, Turkey with a V CW marker at 0044. (Dix-NY)
- 4895.1 Mexican Navy ops from Revillagigedo Island in the Pacific Ocean heard in LSB at 0238. (Reyes-MI) *Thanks Miguel, I am always interested in Spanish language intercepts like this -Larry.*
- 4910.0 Electrical communications from Michoacan State, Mexico in USB at 1600. Purpose of net is to send messages to rural areas, they don't have telephones (Radiograms) in Spanish. (Reyes-MI)
- 5223.0 Pinstripe 1 calling V7B in USB at 1035. I had just heard Pinstripe 1 on 8972 tell V7B to go to 3 Echo 5. 5223 is a CG channel with a designator of 3 Echo 5. (Brown-MA) *Nice piece of work Henry, Bill Battles note-Larry.*
- 5304.3 SLHFB "D" in CW at 0025. (Dix-NY)
- 5606.0 November 7 and Bravo 4 on at 0224 in USB with HF radio checks. (Battles-NH)
- 5759.3 Spanish female 4-digit number station in AM at 0206. (Bill Fernandez-

- 5841.0 MA)
Panther, 97 Charlie and 86 Charlie in communications at 2339 in USB. Customs Echo channel. (Battles-NH)
- 6470.5 6YI-Kingston Radio, Jamaica with a CQ CW marker at 0035. (Dix-NY)
- 6553.0 Scot 86 called by unknown station numerous times from the "sudden metal site" in USB from 2332 to 2345. Anyone have an idea on this one? (Battles-NH)
- 6705.0 CANFORCE 518 working Edmonton on this frequency at 0209 in USB, also tried 9006, 13257, 15031, and 4704 kHz for better communications. (Battles-NH)
- 6761.0 Cado 72, Outbreak and Classroom in communications regarding a downed plane at Tonopah Test Range, Nellis AFB, NV in USB. (Battles-NH)
- 6784.0 English female 3/2-digit number station in AM at 2200. (Mazanec-OH)
- 6788.0 Possible USN ships, M1T and G3O passing coded data in USB at 0651. (Scott Burke-Tucson, AZ)
- 6803.0 KAL23-Department of Energy, Oak Ridge, TN with USB test count at 1748. (J. Metcalfe-Lancaster, KY)
- 6812.0 Crown working Air Force 2 via Andrews with phone patch traffic at 2310 in USB. (John Robinson-Antioch, TN)
- 6840.0 Spanish female 4-digit number station in AM at 0236. (Fernandez-MA)
- 6933.5 Spanish female 4-digit number station in AM at 0307. (Fernandez-MA) At 0300 and 0400 in AM. (Thomas Mazanec-Maple Heights, OH)
Spanish female 3/2-digit number station in AM at 0050. (Ashley Hardesty-South Burlington, VT) At 0039 in AM. (Robinson-TN) *What did everybody camp out here this month? Larry.*
- 7422.0 Experimental call KG2XDL with communications quality score for unidentified station at 1455 in LSB. (Metcalfe-KY)
- 7424.0 Main working Rear with my favorite line in listening to military so far: "This is Main in the plane in the red." at 0115 in USB. (Robinson-TN)
- 7477.0 Oklahoma disaster net operational in USB Wednesdays around 1500. Twenty or so Oklahoma stations, one in New Mexico and a FEMA station in Texas usually participate, but signals weak at my location. (Metcalfe-KY)
- 7789.7 From Mexico, network to aid tourist and mechanical in highway at 0000 in USB from Angeles Verdes (Nickname). (Reyes-MI)
- 7807.2 US military stations H1K66 and T7Q90 in 300 baud packet communications at 1516. (Metcalfe-KY)
- 8180.0 Spanish female 5-digit number station in AM at 0629. (Todd Dokey-Lodi, CA)
- 8418.0 Spanish female 4-digit number station in AM at 0300. (Mazanec-OH)
- 8449.3 8PO-Barbados Radio, Barbados with DE CW marker at 2318. (Dix-NY)
- 8451.0 UBF3-St. Petersburg Radio, Russian Republic calling 4LT3 in CW at 2202. (Dix-NY)
- 8459.0 YQI-Constanta Radio, Romania calling YDOF in CW at 2316. (Dix-NY)
- 8504.0 ZLW-Wellington Radio, New Zealand with a DE CW marker at 1128. (Dix-NY)
- 8515.0 5AT-Tripoli Radio, Libya with CQ CW marker at 2155. (Dix-NY)
- 8546.0 XFF-Coatzacoalcos Radio, Mexico with CQ CW marker at 2355. (Dix-NY)
- 8571.0 UFN4-Novorossiysk Radio, USSR with a DE CW marker at 2212. (Dix-NY)
- 8582.0 XSN-Ningbo Radio, PRC with CQ CW marker at 2204. (Dix-NY)
- 8776.0 Unknown station with an EAM broadcast at 0026 in USB. USN?? (Battles-NH) *Yep, probably so Bill-Larry.*
- 8970.0 5RO calling 9WS connecting to PBX for Starbird 104 in USB at 0210. (Pettengill-Washington, DC)
- 8984.0 Vermont Border Patrol headquarters testing new HF gear with COMSTA Boston and on 8980 at 0021, asked Boston if they had anything higher than 10 MHz to try out and Boston said no, using USB. (Battles-NH)
- 8993.0 Rescue Ops working 988 at 0315 in USB. (Gerry Fichtner-Alamogordo, NM)
- 9000.0 Falcon, Gator, and Red 3 heard here and on 8500 and 6000 in USB testing HF rigs using stair railings, window frames and various other things for antennas from 1341 to 1500+. (Battles-NH)
- 9023.0 Flora 53 (E-3) working Trenton with phone patch to Raymond 24 enroute Mildenhall, UK. Aircraft had equipment problems. In USB at 0044. (Battles-NH)
- 9030.0 Churchman with a standard EAM broadcast in USB 1601. (Joe Kurtz-Hopkins, MN)
- 9090.0 English female 3/2-digit number station in AM at 2100. (Mazanec-OH)
- 9210.0 Spanish female 4-digit number station in AM at 0310. (Dokey-CA)
- 9215.0 Spanish female 4-digit number station in AM at 0310. (Dokey-CA)
- 9230.0 Spanish female 5-digit number station in AM at 0459. (Dokey-CA)

- 9253.0 German female 5-digit number station in AM at 0500. (Mazanec-OH)
 9445.0 Spanish female 5-digit number station in AM at 2312. (Reyes-MI)
 9775.0 English female 3/2-digit number station in AM at 0024. (Bob Fraser-Cohasset, MA)
 10493.0 WGY-901 working WGY-907 at 1418 then changed to 21866 for phone patch traffic in USB. (Battles-NH) WUG-US Army COE, Vicksburg, MS checking into FEMA net at 1605 in USB. (Metcalfe-KY)
 10515.0 Swiss Radio International RTTY Service with news in German/French at 2000 using 50 baud RTTY. (Ulf Vigla-Tavares, FL)
 10600.0 Spanish female 4-digit number station in AM at 2200 and 2300. (Mazanec-OH)
 10665.0 Spanish female 4-digit number station in AM at 0200 and 0300. (Mazanec-OH)
 11031.0 US military station Canopy Forward calling Canopy Rear in USB at 1554. (Metcalfe-KY)
 11090.0 VOA Delano, CA broadcast feeder in USB at 1115. (Mark Burkhardt-New Orleans, LA)
 11149.2 Illegal fishing boat network with X-rated language, et al in USB at 0123. (Robinson-TN)
 11243.0 TUFF 33 with phone patch to Fogpatch Control. Tuff 33 was having problems with #4 hydraulic control. Heard at 2348 in USB. (Henry Brown-East Falmouth, MA)
 11254.0 Stations PG and PJ with radio checks in USB at 1632. (Burke-AZ)
 11330.0 Aeronautical units identifying as Najib 2 and Kamal 01 with a SELCAL check and mentioned all aircraft had been refueled. Some arabic noted in USB at 0515. Who? (Evan Murray-Auckland, NZ) *Good question Evan, my list shows this is a North Pacific/Africa air traffic control channel. Also regional air traffic control in South America and Soviet Union or what ever they are called these days. Sorry I couldn't be of more help-Larry.*
 11430.0 HMF55-KCNA press agency Pyongyang, North Korea with French language news items heard at 2237 using 50 baud RTTY. (Burkhardt-LA)
 11435.0 IMB3-Rome Meteo, Italy with coded weather broadcast using 50 baud RTTY at 2248. (Burkhardt-LA)
 11529.0 Spanish female 4-digit number station in AM at 2214. (Robinson-TN)
 11530.0 Spanish female 4-digit number station in AM at 0221. (Reyes-MI)
 12204.4 YAPD called by NBA-Balboa, Panama with 75 baud RTTY unclass transmissions regarding "Exercise IAWG-91" with the following stations participating: CPFX, CXR, YWM1, PWX, HDN, NPT, CCS, ZPK, 5KM and OBC. (Robinson-TN)
 12682.5 PKE-Amboina Radio, Indonesia with CQ CW marker at 1118. (Dix-NY)
 12707.0 9VG34-Singapore radio, Singapore with V CW marker at 1206. (Dix-NY)
 12712.0 HLW3-Seoul Radio, South Korea with CQ CW marker at 2133. (Dix-NY)
 12740.0 ZLW-Wellington Radio, New Zealand with a DE CW marker at 1141. (Dix-NY)
 12750.0 VHI-Unid Australian with V CW marker at 1310. (Dix-NY) *Any help from down under on this one?-Larry*
 12781.5 9MB-Penang Naval Radio, Malaysia with V CW marker at 1210. (Dix-NY)
 12800.0 HSA3/23-Bangkok Radio, Thailand with CQ CW marker, traffic list and weather broadcast at 1201. (Dix-NY)
 12821.5 DZF-Manila (Bacoor) Radio, Philippines with a CQ CW marker at 1322. (Dix-NY)
 12969.0 XSV-Tianjin Radio, PRC with CQ CW marker at 1143. (Dix-NY)
 13057.0 LSA-Boca Radio, Argentina with a V CW marker at 2145. (Dix-NY)
 13201.0 Activated working Hickam GCCS, HI with message for 2911 at 0229 in USB with, "The chair is against the wall." Could this be an E-4? Odd message. (Battles-NH)
 13207.0 Plantation working Shadow 92 with "If we are not charger in the next 2-4 minutes, we will have to Camaro". In USB at 1940. (Robinson-TN) *Got some real wierd ones this month, didn't you John?-Larry.*
 13211.0 Blue Angel 09 calling MacDill GCCS, FL for phone patch traffic to NAS Pensacola. Requested forklift at NADEP Building on arrival. At 2058 in USB. (Pettengill-Washington, DC)
 13217.0 Spanish language communications in USB. Sounded like a net, possibly military or civilian air ops. Heard Nicaragua mentioned. I hear this net often on this frequency, which is listed for Mystic Star. Communications are of high quality, loud and clear at my QTH at 0410. (Brown-MA)
 13459.2 KCP63-FAA, Longmont, CO with test message for an unid FAA station at 1641 using 75 baud ASCII. (Metcalfe-KY)
 13685.0 6VU73-Dakar Meteo, Senegal with RTTY RY test tape at 0405. (Burkhardt-LA)
 13881.0 KK2XCE-Sunair Electronics, Ft.Lauderdale, FL testing with KTX20. DOT headquarters, Washington, DC in USB at 1352. Also tried 9305.0 and 17555.0. (Metcalfe-KY)
 14270.0 Spanish female 5-digit number station in AM at 0155. In 20 meter ham band. (Penson-MN) *Go get'em intruder watch, and let me know what the response is-Larry.*
 14277.0 N5WIS/KAOMZL-USS Nimitz (CVN-69) Special events station with MT subscriber LT. Arnel Cook at the controls at 0415 in USB. (Janet Williams-Lake Geneva, WI) *Nice catch Janet and glad you caught the LT at the controls, right LT, sir-Larry?*
 14670.0 CHU-Ottawa, Canada time station with usual English/French announcements, time in UTC and time pips at 1558 in USB. (Fraser-MA) *Bob, I can hear this one fine down here in the Bayou-Larry.*
 14811.0 English female 3/2-digit number station in AM at 1500. (Mazanec-OH)
 14900.5 Computer generated voice with "Altitude this is Delta" plus a phonetic message in USB at 1709. Good job of hiding between a Cuban RTTY station on 14900 and the CAP on 14902. (Metcalfe-KY)
 14934.2 NNN0CZJ-USS Arkansas, NNN0COZ-USS Forrestal, and NNN0COH-USS Cape Cod working various stations in SITOP-A at 0044. (Robinson-TN)
 15015.0 Casper 422 working CG Portsmouth, VA at 1920 with phone patch to Furious. Portsmouth advised "We are always up this frequency if you need us". New Frequency??? (Battles-NH) *New for me Bill-Larry.*
 16975.0 RKLK-Arkhangelsk Radio, USSR with a DE CW marker at 1414. (Dix-NY)
 16982.5 KOAT-Unid station calling HKMR in CW at 1420. (Dix-NY) *Anybody out there have any idea who KOAT is? I figure it is a tactical call of some kind-Larry.*
 16987.0 VPS-Cape D'Aguilar Radio, Hong Kong with a CQ CW marker at 1121. (Dix-NY)
 17015.0 SLHFB "D" with CW ID at 2229. (Dix-NY)
 17170.4 ZLW-Wellington Radio, New Zealand with DE CW marker at 2331. (Dix-NY)
 17311.0 KMI-High Seas Radio, CA working Debra Ann with phone patch traffic in USB at 2250. (Burke-AZ)
 17370.0 English female 3/2-digit number station in AM at 1800. (Mazanec-OH)
 17465.0 DGR46-DPA news agency, Hamburg, Germany with German news at 1615 using CW. (Ulf Vigla-Tavares, FL)
 17964.0 Talon 2 working Foxtrot, testing HF 1 & 2 in AM, then USB at 1355. (Battles-NH)
 18000.0 49 calling 71 in USB at 1538. Went to 18010 at 1543 also in USB. (Metcalfe-KY)
 18003.0 Aircraft 1518 working McClellan GCCS, CA requesting a discrete frequency to check radios. They tried 11413 then 18057 due to noise. All in USB at 2042. (Burke-AZ)
 18035.0 Spanish female 5-digit number station in AM at 1503. (Fernandez-MA)
 18165.5 STK-Khartoum Air, Sudan with RTTY 50 baud RY test tape at 2343. (Burkhardt-LA)
 18265.8 VOA Kavalla, Greece working Greenville using 75 baud RTTY at 1220. (Burkhardt-LA)
 18880.0 English female 5-digit number station in AM at 1700. (Mazanec-OH)
 19405.0 FSB63-Interpol Paris, France sending messages regarding information on known terrorist at 0834 using SITOP-A.
 19410.0 KCP63-FAA, Longmont, CO returning to scan at 1635 in USB. (Metcalfe-KY)
 19747.0 6VU79-Dakar Meteo, Senegal with 50 baud RTTY coded weather plus RY test tape at 0343. (Burkhardt-LA)
 20225.0 NAM-US Navy COMSTA Portsmouth, VA with CW weather information around the US at 2230. (Burkhardt-LA)
 21965.0 Spanish female 5-digit number station in AM at 0000. (Mazanec-OH)
 22220.0 English female 5-digit number station in AM at 1600. (Mazanec-OH)
 25271.5 ISX25-ANSA Rome, Italy with English language new items using 50 baud RTTY at 1254. (Burkhardt-LA)

E Q I R

THIS WILL VERIFY YOUR RECEPTION OF THE "EQUINOX" (EQR), 13 AUG, 1990 AT 1220 UTC ON A FREQUENCY OF 16163.1 MHz USB.

POWER: 1500 WATT 1.2KW ERP SHIP TYPE: JULE GARDNER
 TX: HERTZ 000
 RECEIVE: 12/15/89 02 HOURS POSITION: 13.00.00 @ 1700UTC 9652H-0856W
 BATTLES: 0RT, 12241.60 HOURS

THANKING YOU,

(λ - 366)

(ASR, GIMMICK) RADIO OFFICER...
 [Signature & Title]

QSL submitted by Patrick O'Connor of Hinsdale, New Hampshire

The Scanning Report

Bob Kay

c/o MT, P.O. Box 98
Brasstown, NC 28902

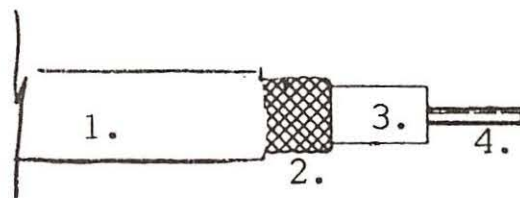
Coax Madness

Imagine for a moment that you're standing in your local radio supply store. Your mail order scanning antenna arrived a few days ago, and you can't wait to try it out. But there's a problem. What type of coax cable should you buy? Directly in front of you are five spools of coaxial cable. There's RG-6, RG-8, RG-8 mini foam, RG-58, and RG-59.

As you examine the diameter of the cables, you immediately notice that no two cables are exactly alike. The RG-8 mini foam and RG-59 cables are thin and flexible. The RG-8 cable is about three times heavier and far less flexible. On further inspection, you notice that the shield braid, dielectric insulator, and center conductors (Sketch #1) are also different. With so many different types of coax cable on the market, which one is best suited for the hobby of scanning?

Asking a store clerk or a friend for help only adds to the confusion. It seems that everyone has a different opinion or personal reason for selecting a particular type of coax cable. And when you tell someone that you're using a scanning antenna, they usually recommend RG-59 cable with factory installed PL-259 connectors. Things become especially frustrating if your scanning antenna and other accessories require that the coax be terminated with an "F" connector.

If the above scenario sounds familiar, don't get discouraged. After reading the next few paragraphs, you'll be able to choose the proper coax cable for your particular scanning needs.



- 1) Outer vinyl jacket 2) Shield braid
3) Dielectric insulator 3) Conductor

Freq (MHz):	50	150	450	1000
RG Type 6	-1.4	-2.4	-4.4	-8.3
8/M	-2.3	-4.1	-8.8	-17.1
8	-1.4	-2.4	-4.6	-8.6
58	-3.9	-5.9	-10.2	-17.0
59	-2.5	-4.2	-7.3	-15.0

Chart 1

dB Loss	% of Loss
-1	21%
-2	37%
-3	50%
-4	60%
-5	69%
-6	75%
-7	80%
-8	84%
-9	87%
-10%	90%

Chart 2



Chart 3

Prior to visiting your local electronic supply house, study the two charts that accompany this text. Chart #1 provides the loss in dB per 100 feet of cable. As you examine the chart, it quickly becomes apparent that the higher frequencies are adversely affected by the physical properties of coax cable.

Although Chart #1 does provide some very useful information, it fails to provide all the facts that are needed. For example: "Exactly what percentage of the signal is lost at -3dB? To find the answer, refer to Chart #2. At this point, you're probably surprised to learn that -3dB represents a 50% percent loss of signal.

By using the two charts as a handy reference source, it's easy to determine that RG-6 exhibits the lowest loss. But let's suppose that the store you're standing in doesn't have RG-6. What other cable could you choose? If you selected RG-8, you're correct. As you can see by looking at Chart #1, the loss in both cables is nearly identical.

Although both RG-6 and RG-8 feature low loss, there are marked differences in the size and flexibility of the cable. As previously mentioned, RG-8 is about three times heavier and far more difficult to bend and hide. Sure, RG-8 can be used for scanning, but it's not the ideal second choice. Most scanner buffs would prefer to use RG-59. While RG-59 does exhibit a higher degree of line loss, it can be easily concealed and terminated with a variety of connectors. To get an idea of how each cable differs in size, refer to Chart #3.

Another hotly debated topic centers around the impedance of various types of coax cable. The impedance of a coaxial line depends on the diameter of the center conductor, the inside diameter of the shield braid, and the distance between them. There are some radio enthusiasts who will insist that coaxial impedance is an important consideration when selecting the proper cable.

If we were using our coax cable for transmitting a radio signal, the impedance of the cable would certainly need to be considered. But since we are only interested in receiving radio signals, we can forget about cable impedance. It's far more important to concentrate on signal loss.

In an earlier paragraph, I mentioned the frustration of trying to match your coax connector to the connector on your scanning antenna. The problem is especially aggravating if you're planning to use "F" type, cable TV accessories.

Suppose that you purchased RG-8. Since the physical size of the cable won't fit into an "F" connector, an adapter must be used. However, few scanner buffs realize that each adapter causes some degree of line loss—sometimes as much as 1 dB!

Cable TV splitters are popular gadgets that can be found in nearly every listening post. If you're using TV splitters in your shack, it's important to remember that a splitter can also reduce the signal strength by a whopping 3dB!

Here's an easy way to check the effectiveness of your antenna system. Count the number of adapters and splitters that are between your scanning antenna and your scanner radio. If your total count is more than two, you could be losing over 75% of the signal your antenna is capturing.

To hear all the radio signals in your area, follow these four easy rules:

1. Use one continuous length of coax between your antenna and scanner radio. Splices are not permitted.
2. Limit the use of adapters and or splitters.
3. If possible, use a "dedicated antenna system." Connect one antenna to one scanner radio, with one continuous length of coax. Use no adapters or splitters in the coax cable.

4. Refer to the charts, and choose your coax cable wisely. If you're in doubt, use Chart #1 to select the cable that exhibits the lowest loss. If you live in a strong signal area, and can sacrifice signal strength for flexibility and ease of installation, choose either RG-59, or RG-8 Mini cable.

My personal cable of choice is RG-6. It can be easily terminated with inexpensive, crimp on, "F" connectors, or with solderless, twist on BNC connectors. Best of all, the hook-up between the coax connector and my scanner radio is direct—no adapters are required.

Do you have further questions? No problem. Send your questions and comments to the Scanning Report, P.O. Box 98, Brasstown, NC 28902. Please include an SASE for a personal reply.

Treasure Hunt

Hurry gang. This is your last month to win a free prize. If you were with us last month, you already know that everyone who enters is an instant winner. That's right! Each and every participant in the January/February Treasure Hunt will win a prize. I've got a truck load of wallet sized frequency allocation cards. Each card contains the frequency increments and agency assignments between 30.0 and 960.0 megahertz.

Here's an example of how the card can be used: Where would you search to find the operating frequencies for inland waterway navigation? If you had the card in your pocket, it would only take a few seconds to determine that the frequencies are between 216.00 and 220.00 megahertz.

To win your very own frequency allocation card, here are the clues:

1. The AR3000 scanner radio has a manual tuning knob. True or False?
2. "Hasta La Vista Baby" is an advertising slogan for what product?
3. In amateur radio, a 144/440 HT is a dual voltage power supply. True or False?
4. I just purchased fifty feet of Radio Shack #278-1312. What did I buy?
5. Provide the price for the MAX system 46-49 MHz Dipole antenna. (November 91 issue of *MT*).

Send your answers to the Treasure Hunt, P.O. Box 98, Brasstown, NC 28902. For this particular Treasure Hunt, I'm asking everyone to include a #10 SASE with their entry. The envelope and postage will help me to return your prize in a quick and efficient manner. And remember, everyone that enters our January/February Treasure Hunt will win the frequency allocation card.

Frequency Exchange

Welcome to the *Minnesota County Sheriff Department*. A scanner buff, known only as "DD," has submitted the following:

County	Frequency	County	Frequency
Carlton	154.800	Pine	155.415
Cass	155.310	Polk	154.815
Cook	155.190	St. Louis	155.640
Beltrami	155.685	Waltonman	155.490
Benton	155.595	Weseca	155.565

If you want the full page list, it's free. Send an SASE to the Frequency Exchange. P.O. Box 98, Brasstown, NC 28902. Ask for "DD's" list.

Our next stop is *Jersey City, New Jersey*. This submitted list of frequencies was signed, "Knobby Base."

- 460.025 South District F-1
- 460.050 Detectives F-5

GUIDE TO UTILITY STATIONS 1992

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7500 new coastal and fixed station frequencies!

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The completely revised new edition includes a frequency list with 19136 frequencies, and a call sign list with 3514 call signs. Up-to-date schedules of FAX meteo stations and RTTY press services are listed both alphabetically and chronologically. Abbreviations, addresses, codes, definitions, explanations, frequency band plans, international regulations, modulation types, NAVTEX schedules, Q and Z codes, station classes, telex codes, etc. - this reference book lists everything. Thus, it is the ideal addition to the World Radio TV Handbook for the "special" stations on SW!

Further publications available are *Guide to Facsimile Stations, Radio-teletype Code Manual* (11th ed.) and *Air and Meteo Code Manual* (new 12th ed.). We have published our international radio books for 23 years. They are in daily use with equipment manufacturers, monitoring services, radio amateurs, shortwave listeners and telecommunication administrations worldwide. Please ask for our free catalogue, including recommendations from all over the world. For recent *MT* book reviews see Jack Albert in 5/91 and Larry Van Hoon in 9/91. All manuals are published in the handy 17 x 24 cm format, and of course written in English.

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- 460.325 East District F-3
- 460.350 West District F-2
- 460.375 North District F-4
- 470.3375 Street Crime
- 470.4125* Street Crime

According to "Knobby Base," the two frequencies containing asterisks are confidential listings that have not been previously published.

Our next invitation came from Ken Windyka. Ken lives near *Springfield, Massachusetts*. Here are a few of his favorite monitoring targets.

- 31.46 Environmental Police - Base
- 31.50 Environmental Police - Mobile
- 33.43 Franklin Co. Fire Dispatch
- 33.46 Hampden Co. Fire Dispatch
- 460.225 State, County, Local Police coordination
- 854.0375 Metro Police (Quabbin Reservoir Protection)

Another anonymous contributor, known as "Psycho Chicken" has invited us to *Kent, Ohio*. Tune in the frequencies, if you dare!

- 151.895 Wards Union 76
- 152.885 Jones Brothers Oil
- 152.915 Hornig Builders Supply
- 152.975 Smith & Cowen Coal Co.
- 154.570 Williams Brothers Mill
- 154.890 Kent Police Ch #2
- 155.310 Kent Police Ch #1
- 158.820 Kent Police Ch #3
- 452.075 Ravenna Oil - Base
- 456.975 Ravenna Oil - Mobile

Let's take a moment to welcome Larry Gold to *MT*. Larry is a new subscriber, and he has invited everyone to *El Paso, Texas*.

153.370 Fire	460.025 El Paso City Police
153.770 Fire	460.125 Downtown Police
154.695 Highway Patrol - Base	460.175 Airport Police
155.460 Highway Patrol	460.300 Detectives
156.030 County Sheriff	460.500 SWAT

Thanks, Larry, and don't forget to tell your friends about *Monitoring Times*.

Do you have a favorite list of frequencies? Afraid to use your real name? No problem. All requests for anonymity will be granted. Send your frequency lists to the Frequency Exchange, P.O. Box 98, Brass-town, NC 28902.

High Tech Hiking

Do you consider yourself to be an outdoorsman? Do you like to hunt and fish? If so, you're probably familiar with compass readings and wilderness maps. Let's suppose that you were lost in the woods. What items would you want in your backpack? Think about it for a moment, and then read the next paragraph.

A hiker recently got lost in Angeles National Forest. The area is approximately 20 miles North of Los Angeles, California. Walter Roden, 64, didn't have a map, nor did he have a compass. He was lost, alone and scared. But then he remembered the cellular phone in his back pocket. He simply called his wife, and told her that he was lost. His wife called the Forest service, and a rescue team was dispatched. A few minutes later, Walter used his cellular phone to call home again. He told his wife that he had found a Ranger Station, and that he would be home in time for dinner.

Can't you visualize the new cellular phone ads? They will probably call it the "Cellsurvival Phone." It will feature a compass, and a complete list of emergency phone numbers. (News clipping from R. Molinar).

Scanner Games

Are you familiar with computer programming? Could you design a "Scanning Game," that would appeal to millions of scanner buffs? If so, you'd better get busy—the race has already begun.

As I write this column, there are numerous individuals and organizations that are in a race to produce the first commercial "Scanning Game." On several occasions, I've been asked to give my opinion on

the type of game that would be appealing to most scanner buffs. Here are my suggestions:

1. Make the game similar to the popular, "Where in the World is Carmen Sandiego?" To simplify the programming, there's no need to include graphics. Make the game challenging, but don't burden the player with highly technical jargon.
2. The game should support CGA or VGA color monitors.
3. Sound animation, although not necessary, would add a nice touch to the game.
4. Make the game sophisticated, but keep it user friendly. The instruction sheet should only contain a few pages. The key strokes required to play the game, should be simple and straightforward.
5. Technical support must be at a level above 110% percent. A toll-free number would be a big plus.

If you're anxious to play such a game, stay with *Monitoring Times* for future updates. When the game(s) become available, you'll be the first to know.

Computer Corner

Hey gang, I've got another frequency/database program that you can have—for free! Here's what you get: The "RAC" frequency data base shareware is contained on one 5-1/4" floppy. Entering frequencies into the program is fast and easy. Within 15 minutes of booting the program, you'll be building your very own frequency database.

Included on the floppy are approximately 200 frequencies for the New England area. Here's an example of the data base contained on the disk:

31.80	Della Construction - Torrington, CT
33.56	Trumble Fire Dept - Trumble, CT
161.70	WICC Traffic reporters - Bridgeport, CT
409.625	State Department, NY
868.775	Norwalk Police - Norwalk, CT

To receive the disk, send the following: One formatted, double density, 5-1/4" disk. I also need a self-addressed disk mailer, with the appropriate return postage. If you can't supply the disk, mailer and postage, here's the second half of the deal.

I'll provide everything, including first class postage to your doorstep, for \$4.00 dollars. To receive the database program, send your disk, or \$4.00 dollars, to Bob Kay, P.O. Box 173, Prospect Park, PA 19076.

Shareware

As many of you realize, shareware is not "freeware." A typical case in point is the frequency database that I'm offering in the computer corner. If you find a shareware program to be useful, the program designer asks that you send in a nominal registration fee. All registered shareware users are informed of new and improved versions of their favorite programs.

Next Month

Will you be here next month? To find out, check your subscription expiration date. Don't take a chance on losing your front row seat—renew your subscription today!

TODAYS HIGH TECH SCANNERS ARE CAPABLE OF RECEIVING TRANSMISSIONS FROM SPACE, SHUTTLE MISSIONS, EXPLORATORY SPACE CRAFTS, AND A VARIETY OF SATELLITE TRANSMISSIONS ARE JUST A FEW TYPES OF COMMUNICATIONS WHICH CAN BE MONITORED.



Northeast Scanning News
P.O. Box 62, Gibbstown, NJ 08027



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Digital programmable 200 channel hand held scanner with raised button keyboard for easy programming of the following frequency ranges: 29-54 MHz, 118-174 MHz, 406-512 MHz, 806-956 MHz. * Features include: Scan delay, memory backup, key pad lock, sidelit liquid crystal display, channel lockout, 10 twenty channel banks, direct channel access, automatic search, full one year factory warranty, 10 priority channels, Ni-Cad battery pack, AC adapter/charger, flexible rubber antenna carry case are all included. Size is 2-11/16" Wx1-3/8" Dx7-1/2" high. (Optional extended 2 yr. warranty \$29.99, 3 yr. extended warranty \$39.99.) (* Excludes Cellular)

#CC-008 Heavy Duty Leather Carry Case \$27.99

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BEARCAT BC142XL	94.99	(7.00)
BEARCAT BC147XL	99.99	(7.00)
BEARCAT BC172XL	139.99	(7.00)
BEARCAT BC177XL	139.99	(7.00)
BEARCAT BC200XLT	269.99	(7.00)
BEARCAT BC205XLT	259.99	(7.00)
BEARCAT BC210XLT	169.99	(7.00)
BEARCAT BC310A	85.99	(7.00)
BEARCAT BC330A	109.99	(7.00)
BEARCAT BC400XLT	99.99	(7.00)
BEARCAT BC560XLT	109.99	(7.00)
BEARCAT BC600XLT	199.99	(7.00)
BEARCAT BC760XLT	269.99	(7.00)
BEARCAT BC800XLT	249.99	(7.00)
BEARCAT BC855XLT	199.99	(7.00)
BEARCAT BC950XLT	249.99	(7.00)
REGENCY R3020	96.99	(7.00)
COBRA SR901	74.99	(6.00)
REGENCY R4010	106.99	(7.00)

MIDLAND CB Radios In Stock
COBRA CB Radios In Stock
UNIDEN CB Radios In Stock
Two-Way Radio Batteries In Stock
Scanner Antennas In Stock
Power Supplies In Stock

RELM RH606B	414.99	(9.00)
RELM UC202 (2 or more)	129.99	(6.00)

SCANNER ACCESSORIES

BCAD70	14.99	BP55	16.99
BCAD100	14.99	MA917	24.99
BCAD140	14.99	MA518	14.99
BCAD 580	16.99	MA501	14.99
BC003	7.99	ESP25	16.99
BC002	59.99	GRE8002	79.99
PS001	12.99	GRE-HH	54.99
UA502A	12.99	GRE9001	89.99
BP205/200	34.99	GRE 3001	62.99
BP70	16.99	FBE	4.00
VC001	12.99	FBW	4.00
BP4	24.99		

BOOKS

Covert Intelligence	8.95
Air Scan Directory	14.99
Betty Bearcat	4.00
Top Secret (7th)	15.99
Covert Techniques	9.95
Tomcat's Big CB	13.95
World Radio	18.99
Survival Directory	6.95
Rail Scan	7.95
Police Call	7.49
Scanner Modification	17.99

RELM RH-256NB HIGH BAND TWO-WAY RADIO



**SPECIAL
PACKAGE DEAL
\$339.99**

(Plus \$9.00 Shipping Each)

16 channel digital readout two-way radio. Covers high band frequency range of 148-162 MHz without retuning. Perfect two-way radio for ambulance, police, fire, tow trucks, taxis, commercial companies who use this band. Features include CTCSS tones built-in, priority, 25 watts output, channel scanning, back lighted keyboard, message light, time out timer, scan delay, external speaker jack. Size is 2 3/4" Hx6 1/2" Wx10 1/4" D.

SPECIAL PACKAGE DEAL includes RH-256NB, mobile microphone, 1/2 wave body mount antenna, mobile mounting bracket and mobile power cord all for the low price of \$339.99

UNIDEN BEARCAT BC-400XLT



\$99.99

(\$7.00 shipping)

Our best selling mobile scanner, 16 channel AC/DC, programmable, digital, AC/DC cords, telescopic antenna, mobile mounting bracket, weather search, priority, 29-54 MHz, 136-174 MHz, 406-512 MHz, external speaker and antenna jack.

BEARCAT BC-100XLT

**100 Channel Digital
Programmable
Hand-Held Scanner**

\$189.99

(\$7.00 shipping)



Our best price ever on a full featured complete package hand-held scanner. Manufactured by Uniden. Features include 11 bands of weather, aircraft, public service, trains, marine, plus more (29-54 MHz, 118-174 MHz, 406-512 MHz), 10 channel banks, 10 priority channels, lighted LCD display, earphone jack, channel lockout, AC/DC operation, scans 15 channels per second, track tuning. Special package deal includes following accessories: AC adapter/charger, rechargeable Ni-Cad battery pack, flexible rubber antenna, carry case.

SANGEAN ATS-803A SHORT WAVE RECEIVER

\$168.99



(\$7.00 shipping)

AM/FM/LW and 12 shortwave bands plus FM stereo, BFO for SSB reception, clock radio. Includes AC adapter, telescopic antenna, stereo headphones, and shoulder strap.

—SHORT WAVE WORLD BAND RECEIVERS AVAILABLE—

Sangean ATS-800	\$109.99	(7.00)
Grundig Yacht Boy 220	106.99	(5.00)
Grundig Cosmopolit	198.99	(7.00)
Grundig Yacht Boy 230	149.99	(5.00)
World Radio & TV Handbook (1991)	18.99	(*)

SPECIAL!! LOWEST PRICE EVER FOR A PROGRAMMABLE SCANNER

Cobra

SR-901

AVAILABLE ONLY
FROM SCANNER
WORLD

ONLY! \$74.99 Each

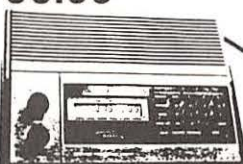
(Plus \$6.00 Shipping Each)

\$69.99 (2 or more)

Features include: 10 programmable channels, one touch memory programming, external speaker jack, 29-54 MHz, 136-174 MHz, 400-512 MHz, squelch, lockout, full frequency digital readout, AC or DC operation, retains memory up to 3 days without power, scan button. Includes AC adapter, telescopic antenna, and complete operating instructions. Size: 7 1/4" W x 2" H x 7 1/4" D. One year factory warranty. (Optional mobile cigarette lighter cord #901MPC \$4.99).

Regency R3020

\$96.99 (\$7.00 Shipping)



20 channel digital programmable scanner, frequency coverage 29-54 MHz, 108-136 MHz aircraft, 136-174 MHz, 406-512 MHz. Features: weather key, search, lockout, priority, squelch, AC only, delay button. Size 9 1/2" x 2 3/8" x 7".

(Limited Quantity of R3020 Available)

UNIDEN BEARCAT BC-950 XLT



\$249.99 (\$7.00 shipping)

**Digital Programmable
100 Channel Scanner**

BC-950 XLT covers the following frequencies: 29-54 MHz, 118-174 MHz, 406-512 MHz, 806-954 MHz (excludes cellular). Features compact size of 6-5/16" Wx1-5/8" Hx7-3/8", scan delay, priority, memory backup, channel lockout, bank scanning, key lock, AC/DC power cords, telescopic antenna, mounting bracket supplied, one year factory warranty, search, direct channel access, track tuning, service search including preprogrammed frequencies by pushing a single button for police fire/emergency, aircraft, weather, and marine services plus exclusive optional features never available on any scanner before. First is an RF receive amplifier for boosting weak signals for only \$34.99 plus a CTCSS tone board is available for only \$59.99 to make this the number one scanner available in the USA. Optional cigarette lighter plug #950 MPC \$4.99.

REGENCY R-4010 \$106.99

(\$7.00 shipping each)

10 channel hand-held scanner. (Same Scanner as Bearcat 55XLT) 29-54 MHz, 136-174 MHz, 406-512 MHz, digital programmable, keyboard lock switch, lockout, includes rubber flex antenna. (Optional accessory 5W-41, only \$19.99 includes rechargeable Ni-Cad batteries, AC adapter/charger and cigarette lighter cord.)



★ SCANNER WORLD HAS BEEN
SELLING SCANNERS FOR
OVER 21 YEARS

★ ALL MERCHANDISE NEW, IN
FACTORY SEALED CARTONS

BEARCAT 70XLT 20 CHANNEL DIGITAL HAND-HELD SCANNER

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**SPECIAL
PACKAGE DEAL
ONLY** (\$7.00 Shipping)

Small size 6" Hx1 1/2"Dx2 3/4"W. Full digital readout, priority, search, channel lockout, scan delay, key lock. Covers following frequencies: 29-54 MHz, 136-174 MHz, 406-512 MHz. Package includes rubber antenna, rechargeable Ni-Cad battery pack, AC adapter/charger and vinyl carry-case.

Optional Cigarette Lighter Cord #UA502 \$12.99
Heavy-Duty Leather Carry Case #CC002 \$22.99

BEARCAT BC-147XLT 16 CHANNEL BASE SCANNER

\$99.99 (\$7.00 Shipping)

Programmable, digital, AC/DC operation. Frequency coverage 29-54 MHz, 136-174 MHz, 406-512 MHz. Weather button, priority, lockout button, squelch includes AC adapter, telescopic antenna.

GM-1TM GLASS MOUNT SCANNER ANTENNA

—ONLY AVAILABLE FROM
SCANNER WORLD—

Frequency coverage 25-1200 MHz — only 22 inches tall. NEW REVISED DESIGN — no holes to drill — no glue needed. Complete with 17 foot cable, Motorola connector, and mounting hardware. Swivels to vertical position — performance unaffected by moisture on the window. Made in USA.



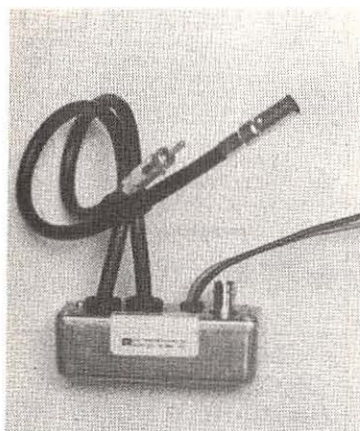
**SPECIAL
\$39.99**
(\$3.50 Shipping Each)

ORDERING INFORMATION: Call (518) 436-9606 to place orders or mail orders to Scanner World, USA*, 10 New Scotland Ave., Albany, N.Y. 12208. Orders will be shipped within 24 hours by United Parcel Service if order is accompanied by MasterCard, Visa, cashier's check, money order, COD (COD shipped by United Parcel Service will be cash or money order only). (If a COD package is refused, customer will be billed for shipping and COD charges.) Mail orders with personal or business checks enclosed will be held 4 weeks for bank clearance. Prices, specifications, and terms subject to change without prior notice. If items are out of stock we will backorder and notify you of delivery date. All shipments are F.O.B. Scanner World* warehouse in Albany, N.Y. We are not responsible for typographical errors. All merchandise carries full manufacturer's warranty. Bid proposals and purchase orders accepted from government agencies only. Free full line catalog mailed 4 times per year. Merchandise delivered in New York State add 7% sales tax. No returns accepted after 7 days of merchandise receipt. * Add (\$5) per item, and \$3.00* for all accessories ordered at same time. COD orders will be charged an additional \$4.00 per package. Full insurance is included in shipping charges. All orders are shipped by United Parcel Service to street address only (No P.O. Box). Shipping charges are for continental USA only. All others ask for quote on shipping charge.

Scanner World, USA® • 10 New Scotland Ave., Albany, NY 12208 • 518/436-9606

what's new?

Larry Miller



Mobile Antenna Adaptor

Electron Processing, Inc., a Michigan firm, has introduced a device that it claims will allow you to bring your shortwave radio or scanner with you in the car without having to mount additional antennas on your car.

Although we have not had an opportunity to see or test the unit, according to EP officials, "Your existing car radio antenna makes a fine receiving antenna when connected to the MSW-1 antenna interface. The MSW-1 covers all frequencies from 0.5 to 1000 MHz and has an internal 10dB amplifier."

The "Hassle Free Mobile Antenna Adaptor" plugs into your car's antenna line and a 12v DC power supply. Car radio reception is reportedly unaffected by the addition of the MSW-1.

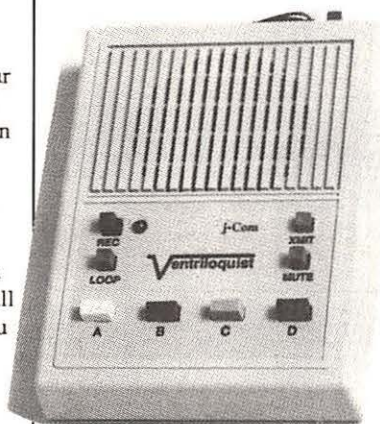
The MSW-1 is available for \$70.00 plus \$5.00 shipping. For more information write P.O. Box 68, Cedar, Michigan 49621 or call 616-228-7020. Tell them that you read about the MSW-1 in *Monitoring Times*.

Remember Edgar Bergen?

One of the tedious tasks of ham radio contesting is repeating your CQ and call letters over and over again for 48 hours until someone hears you or your voice gives out. A new product by j•Com gives operators relief that up until now could only be provided by a carton of cough drops. "Ventriloquist" is an audio memory that holds four variable length messages for a total of 20 seconds of high fidelity audio.

Housed in an attractive ivory enclosure measuring 4" x 5" x 1", the unit contains both speaker and microphone. Because Ventriloquist's memory is non-volatile, the messages can be retained in memory for up to 10 years, even if the power is turned off.

An endless loop record and playback feature also allows Ventriloquist to record audio off the air. The unit can be stopped and will play back the last 15 to 20 seconds to verify a report or callsign. Used in conjunction with the j•Com Magic Notch filter, heterodynes caused by carriers can even be eliminated in the replay.



Ventriloquist requires 9 to 16 volts DC at less than 80 Ma. 60 mW of audio output is available to drive the internal speaker or an external device.

Ventriloquist comes in two forms, as an assembled and tested PC board which retails for \$124.95, or in a second version which includes a high impact ABS enclosure priced at \$149.95. Shipping is paid in the United States. For more information, contact j•Com at 408-335-9120 or write P.O. Box 194MT, Ben Lomond, California 95005.



Putting a Face on the Voice

Amateur TV is probably one of the most exciting and overlooked facets of ham radio. Those who are involved — and the numbers are in the mere thousands — seem to really have a lot of fun.

Besides the basic you-transmit-I-receive arrangement, ATVers have been known to climb mountains and brave crowds at parades in order to provide exciting video for other ATVers. There seems to be no limit to the ATVer's imagination.

We are told that a 1 watt transmitter and a camera hung from a helium-filled balloon at 125,000 feet produces breathtaking views that can be picked up from as far as 500 miles away.

If this sort of "hamming" seems exciting, check out Amateur Television Quarterly's *ATV Secrets for Aspiring ATVers*. It's an easy-to-read introduction that covers the hobby from A-to-Z.

The 60 page book is an affordable \$11.50 postpaid. Get yours by writing to ATV Quarterly, 1545 Lee Street, #73, Des Plaines, Illinois 60018. Say "cheese" and tell 'em *Monitoring Times* sent you. One other thing: even no-code novices are eligible to operate amateur TV stations.



Fast-scan TV Transceiver

AEA has introduced a new Fast-scan TV Transceiver called the VSB-70. (VSB stands for Vestigial Sideband, which is the same method used by commercial TV stations. It concentrates almost all of the power into one sideband, reducing bandwidth and conserving spectrum space.)

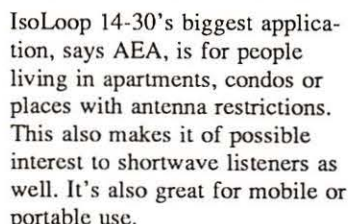
Receive tuning can use the crystal-controlled receive for a set frequency or use the VFO for other frequencies or drifting transmitters. The VSB can be hooked to a standard television and display both received images and your monitored transmitted signals on the screen. Hook up is via a common 10-pin camera connector or video and audio RCA inputs.

The VSB-70 features 1-watt P.E.P. output, separate microphone and PTT inputs with high-quality construction.

For more information, contact your local ham dealer or Advanced Electronica Applications, Inc., P.O. Box 2160-MT, Lynnwood, WA 98036; 206-775-7373.

Compact IsoLoop HF Antenna

The IsoLoop 14-30 is an unusual-looking circular antenna that covers everything from 10 to 30 MHz. Transmit power capability is 150 watts. The



Tighten two nuts and the IsoLoop is mounted on your TV mast. The IsoLoop 14-30 is also at home in the attic. Measuring 43 inches in diameter, it has all-welded construction, which suggests maximum efficiency even after years of exposure to the weather.

Tuning is accomplished with the (included) LC-2 Loop Controller. An optional frequency indicator is available for easy tuning. For pricing or additional information, contact your local ham dealer or AEA at the address above.



Cellular Security Group's catalog of VHF/UHF MAX System Antennas is now available. It features 800 MHz antennas, 46-49 MHz cordless phone and baby monitor anten-

nas, general coverage mobile antennas, telescopic whips for handhelds, cable and adapters.

You can get your copy of the catalog by writing to 4 Gerring Road, Gloucester, MA 01930. Tell them that *MT* sent you.

Two Masters are Better Than One

Scanner Master Corporation has two new entries in its series of directories. *The Virginia/Metro DC Guide* follows Scanner Master's tradition of quality contents paired with quality printing.

New to this edition, however, are extensive federal government and military listings for Washington, DC, a void in previous directories. News press frequencies are covered in detail as well, and CTCSS tones are listed when known.

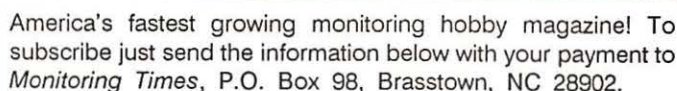
Collections of ten codes and radio abbreviations enable the listener to understand more of what he's hearing.

Listings are arranged geographically, then alphabetically by agency. A separate frequency cross-reference enables the listener to research a frequency on which he finds activity.

*Scanner Master's Virginia/
Metro DC Guide* is \$29.95 plus
\$2 shipping from Scanner Master
Corp., PO Box 428MT, Newton
Heights, MA 02161.

NY/NJ metro scanner enthusiasts will enjoy Scanner Master's *New York Metro/Northern New Jersey Pocket Guide* by Warren A. Silverman. This little pocket directory concentrates on public safety, but lists transportation services, press frequencies and other services of interest to the hobby as well.

The New York section includes not only New York City, but Nassau, Suffolk, Rockland and Westchester counties. New Jersey listings are for Bergen, Essex, Hudson, Passaic, Middlesex, Monmouth and Union counties.



U.S. (mailed second class*):

- ☐ 1 Year \$19.95 (12 Issues) ☐ 2 Years \$38.00 (24 Issues) ☐ 3 Years \$56.00 (36 Issues)

* If you prefer first class mail in an envelope, add \$25.00 per year (i.e., one year = \$44.50)

Payment received by the 10th of the month will receive next month's issue. Current or back issues, when available, can be purchased for \$4.50 each (includes 1st class mailing in U.S.)

Canada, Mexico and Overseas:

(mailed in an envelope second class*)

- ☐ 1 Year \$28.50 ☐ 2 Years \$55.00 ☐ 3 Years \$79.50

* If you prefer air mail, please write for rates.

All foreign subscriptions must be paid by Visa, Mastercard, International Bank or Postal Money Order in U.S. funds.

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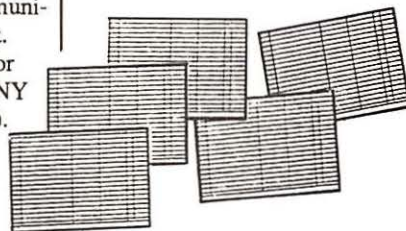
ZIP

Month

Year

☐ Mastercard ☐ Visa[illegible]

The pocket edition is distributed by Firecom Communications, P.O. Box 61-G, Dept. MT, New York, NY 10011 for \$13.95 plus \$3.50 shipping (NY residents add \$1.44 sales tax).



Scanner Logsheets

Probably no other portion of the radio spectrum houses as many transmitters as the VHF/UHF bands. If you're serious about your scanning, you'll need some sort of way to organize all of that data. After all, if there's one secret to successful scanning, it's record keeping.

DX Radio Supply is offering a pack of 50 sheets of professionally-prepared log sheets, printed both sides, that give you space for some 1,800 entries. There's room to record frequency, mode, agency, transmission summary and time.

Scanner Logsheets are just
\$5.99 plus 1.50 book rate or 3.00

UPS. Write DX Radio Supply at P.O. Box 360, Wagontown, PA 19376 or call their 24-hour automated order recorder at 215-273-7823. Tell them you read about it in *Monitoring Times*.

Winnipeg Frequency Directory

Joe Lockhart remembers the reaction he got when he first started his frequency directory: "You'll end up in jail if you print that kind of information!" Joe, who is general manager of Winnipeg's Locktronics, is now

offering the second edition of *The Scanner Book*, proving once and for all that scanning and jail time are not necessarily synonymous in Canada.

Almost 75 pages long, it contains information "compiled by scanner listeners and not taken from government files." The book is divided into three sections and includes a by-frequency listing, an alphabetical listing and a by-type of transmission listing. It's a solid, information-packed book presented in a friendly, practical way.

You can get your copy by sending \$15.95 to Locktronics, P.O. Box 32074MT, Dickens Post Office, Winnipeg, Manitoba R3E 3M7 or call 204-632-SCAN.

Klingenfuss

The Air and Meteo Code Manual

Unlocking RTTY Codes

It is common for the newly-initiated radioteletype enthusiast to fire up his RTTY demodulator, tune in the tell-tale "diddly-diddly" sound of FSK, then sit back in disbelief as interminable batches of numbers and letters print out line by line.

Is the equipment working properly? Is this a spy channel with encrypted messages? Has the hapless interloper spent hundreds of dollars on worthless accessories? Yes, no and no.

Just as Morse messages are loaded with abbreviations for rapid informational exchange, RTTY, too, has its shorthand — especially weather networks. But

without a translator, the shorthand remains unintelligible gibberish.

The Air and Meteo Code Manual by Joerg Klingenfuss, now in its twelfth edition, is the answer to this dilemma. Compiled from official publications of regional and worldwide meteorological centers, the manual is an indispensable reference for the RTTY monitoring enthusiast.

The manual, published by Klingenfuss, is available in the U.S. for \$29.95 plus \$1 shipping from Universal Radio (1280 Aida Dr, Dept. MT, Reynoldsburg, OH 43068) and other MT advertisers.

Brushing Up on the FAX

If it's radio facsimile, instead of radioteletype, that kindles your enthusiasm, few software programs can equal the performance of PC HF Facsimile by John Hoot. The 200-page manual, professionally printed and bound, contains an excellent overview of facsimile, along with a glossary of terms and comprehensive, up to date frequency lists and schedules of facsimile stations.

The FSK demodulator, cable and software disk are included along with a tutorial audio cassette. You provide the shortwave receiver, IBM compatible with at least 512K RAM, a serial port and video monitor (Hercules, CGA, EGA or VGA); a printer is optional.

FAX images are received and stored with 16 gray levels with a resolution of 640 x 800, printable on Epson, IBM, and HP Laser Jet printers.

All hardware attaches to the RS232 output port of your computer; no internal installation is required.

If you are looking for a good, inexpensive way to get started in WEFAX or even newsFAX, look no further. Send \$99 plus \$7 shipping to Software Systems Consulting, 615 S. El Camino Real, Dept. MT, San Clemente, CA 92672.

Men Who Made Waves

"It was a time in history when lonely, brilliant inventors were first grappling with the notion of actually sending messages on nothing more than a wing and an airwave," writes Joe Logan in his review of *Empire of the Air: The Men Who Made Radio*.

While much has been written about the "inventor" of the wireless, Guglielmo Marconi, author Tom Lewis looks at the men who refined the Italian inventor's work. The story of the three men, Sarnoff, de Forest, and Armstrong, is a sad one. David Sarnoff, a Russian immigrant, went on to become "the visionary, egocentric and ruthless chairman of the nation's most powerful manufacturer and marketer of radios, Radio Corporation of America (RCA).

Lee de Forest, developer of the vacuum tube — essential to the success of radio — was the somewhat aloof, Yale educated son of an Alabama preacher. Married often, he struggled constantly to find financing for his grandiose experiments, dying with just \$1,400 in the bank.

Edwin Armstrong, who is credited with a number of innovations (including FM), battled de Forest all the way to the Supreme Court over patent infringements, eventually taking on Sarnoff as well.

Armstrong, the product of an old New York family, spent his entire fortune on lawyers, becoming bitter, physically attacking his wife (who left him), and ultimately plunging to his death from the 13th floor of his building.

Empire of the Air: The Men Who Made Radio is a 421 page hardback, available for \$25.00 from most bookstores.

Eaves- dropping Detection and Prevention

Ross Engineering's intensive 2-day seminar on Eavesdropping Detection and Prevention is over. Fortunately for those who could not attend, there are affordable \$10.00 audio cassettes of the seminars available to the public.

Topics include "Radio Bugs, Where Are They?" "Electromagnetic Emissions," "Who Planted the Bug?" and "ECPA 86, What's Wrong with It?" You can get a complete list of topics by sending a self addressed, stamped envelope to Chesapeake Audio/Video Communications, Inc., 6330 Howard Lane, Dept. MT, Elkridge, Maryland 21227. or by calling 410-796-0040.

Shinwa SR-001 to Remain in Production

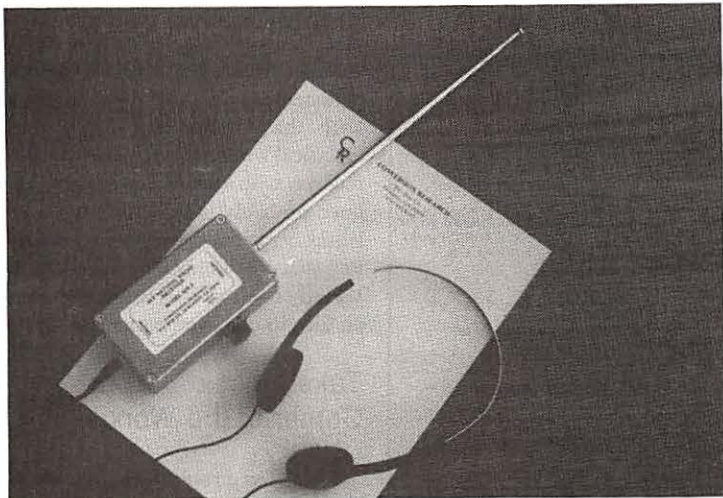
A number of readers expressed bewilderment at our item in the January issue stating Shinwa's intent to discontinue their advanced model SR-001 programmable scanner. Apparently, Shinwa was deluged with inquiries as well.

Shinwa has taken user comments seriously and will give the scanner another chance. The two most serious complaints, strong signal overload and the poorly written instruction manual, have been addressed by the manufacturer.

The improved scanner is now available for only \$375 directly from the manufacturer by calling 800-627-4722. Free information on the modification and manual changes may be obtained as well.

Review

WR-3 VLF Natural Radio Receiver



Whistlers, swishers, and swishlers? Perhaps these aren't your prime listening targets but then again, perhaps you've never heard them.

The first few kilohertz of the electromagnetic spectrum — the basement band of radio — is often alive with strange noises, mostly originating from our atmosphere, thus contributing the term "sferics" to the scientific lexicon.

It doesn't take a lot of sophisticated equipment to hear these natural noises; as a matter of fact, for only \$48 including postage you can order the WR-3 from Conversion Research, PO Box 535-MT, Descanso, CA 91916. All you will need to provide is an inexpensive set of earphones (1/8" mini phone plug).

The WR-3 is housed in a rugged, die-cast aluminum box; a 33 inch telescoping whip is provided. Simply switch the unit on and listen to the 100 Hz - 10 kHz spectrum. A volume control permits adjustment to comfortable listening level.

The circuit is a high gain audio detector; changes in voltage gradients between the whip and its counterpoise "ground" (the listener's body) register audibly in the earphones.

Besides listening to naturally-occurring electromagnetic sounds, the WR-3 also makes a dandy electrical interference locator. Walking around the MT offices with the unit on revealed a variety of offending electrical devices.

If you are interested in listening to sferics, don't bother to design and assemble your own receiver when an effective, inexpensive, ready-made receiver like this one is available.

A sample tape of the many natural atmospheric signals to be heard with this receiver is available for \$8 from Conversion Research at the address above.



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 "The best program to come along in a long time - I highly recommend it to those who want to learn Morse properly" - Ike Kerschner, N3IK, Monitoring Times
 "One of the top Morse trainers available", Gordon West, WB6NOA

If you are just a beginner, then *MorseMan Plus* will teach you the code, at your own pace and speed, and is even Farnsworth selectable. After you know the code, *MorseMan Plus* lets you progress rapidly by allowing you to choose from a variety of training methods that are geared toward helping you gain proficiency in the fastest possible time. You can choose from copying random characters, true random words (from a 50,000 word database), listening to computer simulated QSO's (over 3 trillion different ones possible), realistic random call signs (in pileup fashion) - you can even take a simulated FCC/VEC code exam. You can also create and send ASCII text files as well as practice only the characters that you desire. *MorseMan Plus* will even record everything it generates to a file for later use.

So, if you want to get ahead in your Morse Code training, without the headaches, then get *MorseMan Plus*. For only \$24.95 (plus \$4.00 s/h, \$9.00 overseas) you can have the best training program available. Call 1-800-525-7235 anytime, 24 hours a day (or fax 205-757-8664) to order with Visa or Mastercard, or send Check/MO to the address listed below.

(*MorseMan Plus* requires an IBM-PC or compatible with at least 512k RAM and DOS 3.0 or later. Please specify disk size when ordering)



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Apartment Antenna Strategies

Ever since Humankind came down out of the trees we have sought out what has come to be known as THE AMERICAN DREAM. The central focus of this dream usually involved acquiring work, food, transportation, a dwelling and someone to snuggle with. For those of us who came down from the trees and discovered that Galena crystals could detect radio signals, the American Dream has been a bit more problematic. The food and transportation part are about the same but we need a better job to pay for all that radio gear, a snugglebunny who does not mind us disappearing into the basement in the middle of the night to track Radio Freedomia, and, last but not least, a dwelling that does not hinder our hobby.

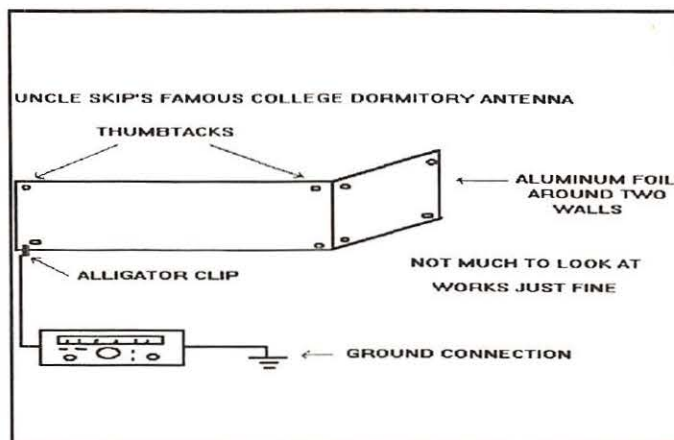
Where is this warped view of history taking us, Uncle Skip?

Relax Boss, I know of what I speak.

Some folks have not found The American Dream to include a single family dwelling. For whatever reason, these folks have sought to follow the path of our long distant ancestors and (in effect) return to the trees. They live in high-rise apartment buildings. Now there is absolutely nothing wrong with this regression exercise... Unless they are radio monitors!

It's as if the architect who came up with the concept of the high-rise was scared by a radio when he was a tyke. Most apartment buildings seem to be designed to inhibit the pursuit of radio pleasure. Whether your high-rise is in Honolulu, Hawaii, or Homer, Alaska, chances are you are living in RF hell. Whenever I take this show on the road to speak to radio groups or at the MT convention, I always run across a large cross section of folks who have to contend with the evils of apartment listening and landlords who threaten to cut their legs off if they try to string an outside antenna.

All is not lost, my apartment dwelling Bunkies. Old Uncle Skip spent enough time condo crawling to come up with a few notions on how to get the most monitoring out of an otherwise bad situation. The rest of you stick around, too, because these ideas can also help you with monitoring out of motel rooms when you travel or surviving in a dwelling covered



with (gulp) aluminum siding. Get ready to string some wire as Uncle Skip's Communication Service and Cyberspace Emporium brings you...

UNCLE SKIP'S GUIDE TO INDOOR ANTENNA BLISS

First, we should take a look at the problems that apartment dwelling presents. You can conduct a practical experiment to show these general effects. Take a self contained portable radio and tune it to a powerful station. Now, take this radio and place it inside your kitchen oven. (Make sure the oven is OFF; burnt plastic smells terrible.) Even with the door open you will probably notice that the signal drops off sharply. That is because the metal of the oven surrounding it is shielding the receiver on five sides. Now, close the door. The signal will drop off even further because now the receiver is shielded on all six sides and the signal coming to it can only reach it through the observation window in the door.

Most high-rise apartment buildings are constructed with metal beams and girders. Also the walls are full of the plumbing and wiring harness for the multitude of residents. Add to this all of the other residents switching on and off various appliances and electrical devices (including color television sets that generate a certain amount of RF noise) and you have a shielding situation akin to putting your receiver into the oven. Between the metal shielding and the human made electrical noise generated by your fellow vertical cave dwellers, it is a wonder that you can hear anything at all.

Further, any antenna system you develop

will not follow the textbook design parameters because it will interact with the surrounding metal and electrical wires. If you have a portable receiver with a whip antenna on it you have probably noticed that it works better or worse depending on where you place it within your apartment. Usually it works best near a window, similar to our oven experiment.

Take a Look at Your Corner of the World

Go through your apartment and get a notion of your best possible antenna locations. Pay special attention to any crawl space or attic access. These areas can often allow you to string antennas almost as long as many practical outside antennas.

Try to figure out the longest straight line through your rooms. For example, you may find that you can eyeball a line from your kitchen, through your living room, through your bedroom and into your bathroom with the line terminating near the bathroom window. In this case you can string a simple longwire antenna that would run the length.

Remembering our oven tests, now look at your apartment with an eye to locating antennas that run nearest to windows. Also note locations where you might run wire in an "L" shape along two walls. Don't spend all of your time looking up at the ceiling. In a high-rise apartment you may find it is less hassle to string your antenna wires along your baseboard. Experimentation might even indicate that you get better results by using the floor.

Constructing Simple Antennas

Now that you have checked out locations for stringing wire, head off to your local hardware or electrical store and buy a big spool of common garden variety stranded hookup wire. You can use a relatively light gauge such as No.20. For experimenting you can use almost any insulated wire you may have around. Once you have figured out your best antenna strategy, you can purchase wire that will be pleasing in size and color. If your receiver does not have screw type terminals for external antennas you will need to consult your owner's manual for proper connectors and purchase a few of the same.

A good place to start your experiments is with a wire cut to 24 feet in length. This works out to a quarter wavelength on the 31 meter shortwave broadcast band. Try this antenna in a few of the locations you have picked as possible listening posts. Conduct listening tests with the wire horizontal, vertical, "L" shaped, zig-zagged across a window, etc. You can't really do anything wrong in this experiment. You are just trying to find a wire location and configuration that will yield the best results.

Take notes on what works and what doesn't. Once you have exhausted the possibilities of the 24 foot wire you will probably have sufficient savvy to try a few longer or shorter wires to check for improvement in signal quality. Remember, most of your battle is with strong local interference and not weak broadcast signals. Reduce the noise floor and the signals will pop up all over the bands.

You will probably discover that you will want to use several antennas of varying lengths. Also, indoor antennas in excess of 48 feet (1/4 wave at 60 meters) will produce diminishing returns as you get right down among the kind of noise that you are fighting to overcome.

Another simple antenna can be constructed out of common aluminum foil hung with thumbtacks around two walls of your apartment. You connect the foil with an alligator clip (available at most hardware stores) and a short piece of wire, as shown in the sketch. Old Uncle Skip logged over 100 countries in his grad school dorm with just such an antenna.

Don't forget that a good ground connection will help to battle noise and interference, so remember to follow your owner's manual for establishing a ground connection. You will most likely have to utilize the cold water pipe in your bathroom or kitchen.

What Light Through Yonder Window Breaks?

Many apartments have balconies attached to them. The balcony area will allow for all manner of outside antenna experiments, most of which will not give your landlady apoplexy.

One of the first things I always recommend to any apartment dweller with a balcony is GET PATRIOTIC!!! Head out to the department store and buy a U.S. flag and pole kit. Using one of the pole sections as a guide, go to your neighborhood hardware store and buy the longest piece of similar diameter aluminum tubing you think you can get away with. Use this replacement pole as the staff by which Old Glory will hang. If you happen to run a length of feed line from it back into your receiver who is to be the wiser?

You can also conduct experiments similar to those for indoor antennas. Remember that outdoor

antennas should be disconnected from your receiver when not in use and during any electrical storm activity. Place the connector outside or in a glass jar when not in use. Also do not run your outdoor antennas in such a way that they can come into contact with power lines. You can't enjoy this hobby if your nose lights up every time you try to turn your receiver on. Be Careful Around Electricity!

Stealth Antennas

If you are fairly high up in your high-rise and you only do your listening after dark, you might try a more challenging antenna project. Using very light gauge wire such as No.24 or No.26, you can lower an antenna out of your window by placing a one or two ounce fishing weight on the end. The length of this antenna is only limited by how high up your window is. Be very careful that you don't lower this antenna onto your landlord's head or you may find yourself shopping for a new abode. Reeling this antenna in when not in use should keep people from being disturbed by your hobby. Again, watch out for power lines.

Fiddling on the Roof

If you live on the topmost floor of your apartment building, you may want to consider asking if you may put up an antenna. Believe it or not, I get letters all the time from folks who have negotiated this privilege out of their apartment managers. Hey, it's worth a try, and your listening will improve enough to justify the asking. If you do work out an antenna arrangement, make sure you keep your parts of the bargain so that the next radio person who moves into your high-rise can enjoy the same privilege.

What About Active Antennas?

Active antennas could be the subject of an entire column. Before you go sinking a lot of money into an active antenna system, you should try the aforementioned experiments to see what your signal acquisition situation really is. You may be pleasantly surprised.

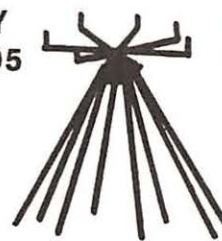
Further Reading

You can never know enough about antennas, especially if you live in an environment that is hostile to listening. To this end I strongly recommend *The ARRL Antenna Book*, Gerald L. Hall, K1TD Editor, \$20.00, published by The American Radio Relay League and available through many radio book dealers or write the ARRL (225 Main St., Dept. MT, Newington, CT

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06111). Another exceptional antenna book that includes several discussions of limited space and apartment antennas is the now out of print *Easy-up Antennas for Radio Listeners and Hams* by Edward M. Noll, \$16.95, published by Howard W. Sams & Company. Some dealers may still have this book in stock or you may be able to find it in the library.

Are We Having Fun Yet?

Setting up a listening post in a high-rise apartment or condominium can be frustrating at first. But a little bit of experimentation and tenacity will yield results that may even put your single family dwelling friends to shame. Apartment antenna testing is inexpensive and fun once you get into it. And it doesn't hurt that you will learn a bit of antenna theory along the way.

Uncle Skip On-Line

Those of you who have a home computer and use the GENIE telecommunications service can now drop a line to Old Uncle Skip at his GENIE mailbox T.AREY1.



TVRO News Round-Up

Most of what passes for news in the various trade journals involving satellite television is little more than undisguised optimism from the public relations office. However, there are times when genuine news items surface which tend to show the less hyperbolic side of this industry. The following items are cases in point.

Japan and the HDTV Myth

A common misconception among Americans is that while we're still watching our dreary NTSC standard TV sets, all of Japan enjoys High Definition TV (HDTV) with Compact Disc (CD) quality audio. The fact is that even in Japan HDTV is in the experimental phase.

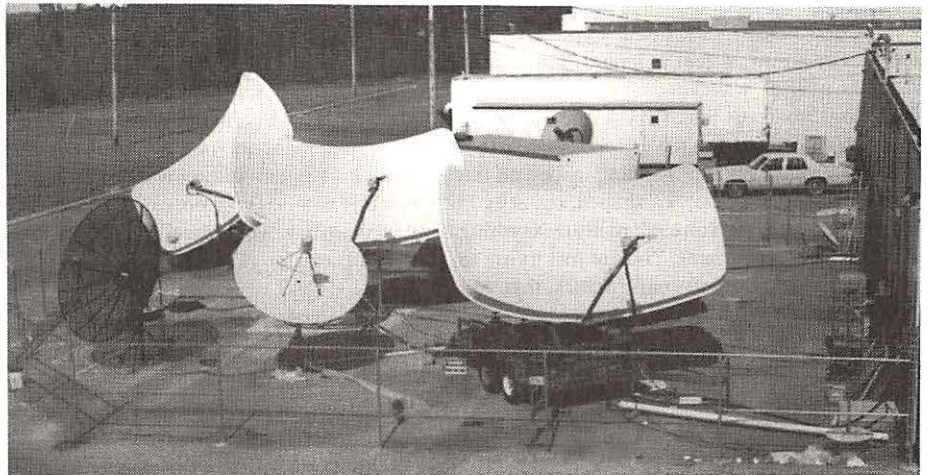
Japan Broadcasting Corp. (NHK) continues to experiment with HDTV transmissions to Japanese viewers. Until recently these experimental transmissions were for only a few hours per day. As of the first of December of '91 the schedule was increased to eight hours per day. But even in Japan such viewing privileges are for the financial elite. HDTV sets cost \$31,000 each. For that price you get a resolution of a little more than twice what you would see on a typical NTSC standard set. Fewer than 1,000 sets in Japan have been sold.

So, is there an "HDTV Gap"? Not at all. Rest assured that America's technology laboratories are working overtime to see that Americans will have the opportunity to see HDTV within the next several years. But you should be advised to start saving for occasion. It is estimated that prices for U.S. HDTV sets will run in the five to eight thousand dollar range.

Changes at PBS

Last fall, after years of transmitting in VideoCipher II encryption, PBS finally gave up and returned to "in the clear" transmissions. The reasons for the change were as vague as those for beginning VCII encryption in the first place. At any rate, the switch was warmly greeted by TVRO enthusiasts who had steadfastly refused to buy VCII decoders. (PBS was always transmitted in the "fixed key" mode which required no subscription and one feed was always in the clear.)

The celebrating may have been premature, however, as a report in *Broadcasting Magazine* from November 25, 1991, indicates. Several years ago PBS bought six channels on the as-yet



Dish farm at Shop At Home. Signals to three satellites are uplinked from their backyard via the three rectangular parabolic antennas. The two in front are beamed at F4, the one in the back is beamed at G1. The three small dishes are down-link only used to monitor the transmissions. Note the trailer under the foremost dish making it portable.

unlaunched Telstar 401 satellite. (The bird is slated to be launched in mid-1993, which, given past schedule fiascos, may be overly optimistic.) The PBS purchases break down like this: five channels are in the Ku band and one in the C band. In addition, these Ku channels will have an output of 60 watts with one at 120 watts.

The real news, though, is that PBS plans to use a digital compression scheme. According to the *Broadcasting* report, PBS plans to settle on a compression system by this summer. The final blow is that these digital compression decoders are slated to sell for \$1,000 each with no announced plans to make them available to the general public.

The advantage to PBS in using compression technology is that it will allow them to have several channels broadcast simultaneously on each satellite transponder. Among the possibilities are transmissions in an HDTV format, and "specialized" learning channels. As with its earlier efforts with VCII, PBS's announced plans may raise questions that won't be answered. How happy will local affiliates be with buying more decoders with the taste of the VCII still in their mouths? How will HDTV transmissions be sent to viewers? Over non-existent terrestrial HDTV transmitters? Direct to consumers via satellite if they cough up \$1,000 for a decoder? I can't hear those pledge phones ringing!

Who's In Charge Here?

With some 40 satellites in the air and hundreds of commercial users of all the various transponders, it's a wonder that more things don't go wrong. According to industry sources there are hundreds of incidences of bungling

behind the scenes each year.

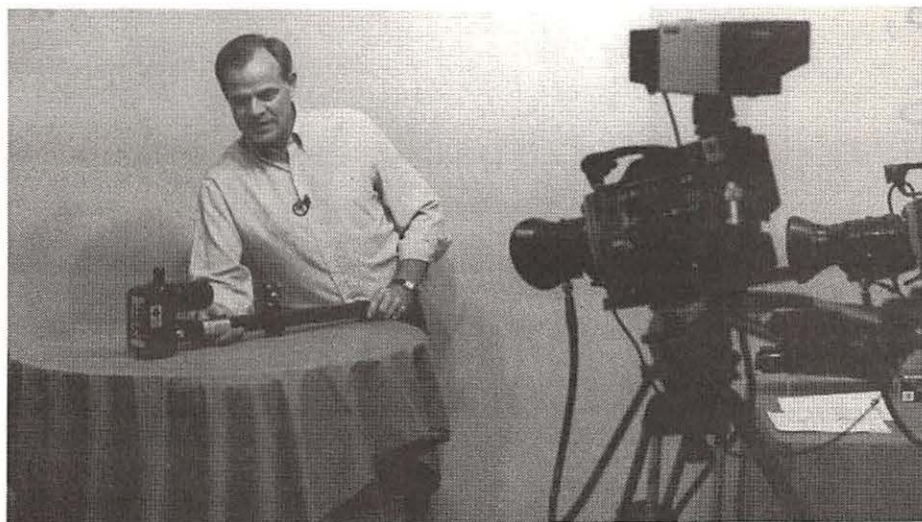
The biggest problem is from satellite news gathering (SNG) units which are portable up-link facilities used in the production of news stories for America's ever-growing appetite for news. SNG operators sometimes forget which polarity, channel or satellite they're supposed to be on; The result is a big headache for the uplinker who's where he's supposed to be.

One incident which caused a lot of excitement happened last fall when NASA decided to move one of its TDRS (Tracking and Data Relay) Satellites. Without bothering to tell any of the other satellite operators and somehow turning on their C band transponders, the ensuing interference with Galaxy 1 (the big cable bird) caused havoc throughout the cable industry for nearly a day.

Spurious signals from out-of-whack VSATs (Very Small Aperture Terminals) such as those used for data transmissions in the banking and commerce field are also said to be able to cause untraceable interference for days.

C-SPAN and the VOA

Last November, C-SPAN added programming from the Voice of America Worldwide English service to its line-up of international broadcasters on C-SPAN's Audio 1 service. "Adding the VOA gives our listeners an opportunity to hear what other nations are hearing about America," said Beth Glatt, C-SPAN Audio Networks Manager, in a press release. The Audio Networks are available in 63 cable systems affiliates nationwide. This compares with over 10,00 affiliates for TBS Superstation. It is, of course, available to over 4 million TVRO viewer/listeners.



Shop At Home studio. Bill Beason sells an actuator. Cameras are Sonys.

A Visit to Shop At Home

On the way back from the Monitoring Times Convention last October, my wife and I made a little detour to drop in on the folks at the Shop At Home network. SAH has been a pleasant surprise to many TVRO viewers who were expecting the usual shopping channel with its abundance of ceramic clowns and cubic zirconia.

We were met at the studios of SAH by Bill Beason, on-air personality and life-long resident of this beautiful eastern Tennessee region. Bill gave us a tour of the entire facility including a look at the transmitter production and control rooms. We also got a close look at the dish farm behind the studios.

There's nothing slick about SAH, neither in its on-air appearance nor behind the scenes. It's just a bunch of local folks working hard and making some pretty good deals available to viewers. There are no pretenses at SAH. The channel caters to the home dish market and makes available a wide range of products involving satellite television. From complete satellite systems to books and installation aids the channel on F4 15 is a good place to watch for new TVRO products.

If you don't have a TVRO system and are pricing them from various sources you may want to include SAH in your quotes. Call them at 800-366-4010.

MAILBAG

My thanks to those who wrote to point out a teensie little error in my November, '91 column regarding SCPC reception. Using an Icom

R-7000 or other receiver such as a scanner capable of tuning the 950-1450 MHz range, split the signal from the LNB and feed one leg to the satellite receiver and the other to the 7000. You still need to make sure you're not passing DC voltage from the LNB into your expensive radio.

Loren Cox, of Lexington, KY and a contributor to *Review of International Broadcasting*, writes: "Notice in your column you sometimes include photographs taken from the TV screen. Would like to know just how you accomplish this, as I would like to share some of my more interesting "contacts" with readers..."

I have experimented with many different methods of taking photos from the TV screen. Here's what I found works best. I use a normal ASA 200 speed film on a Mamiya SE 35 mm camera with standard 55 mm lens.

Setting up to take pictures takes a little time. First darken the room, if possible, so that the major light source is the TV screen. Position the camera on a tripod or improvised stand (I sometimes use a stack of books on a chair) so that it is level with the screen. Frame the picture so that you have a good margin around the edge of the screen. (This is done because not all developers will be careful to include your entire frame in the print. Compare your print with your negative and you may be surprised at what is left out.) Finally, if you are using an automatic camera set it for the manual mode and set the shutter speed for 1/30th sec. Set the lens aperture to allow as much light in as possible. Experiment and good luck!



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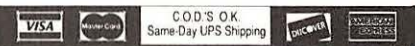
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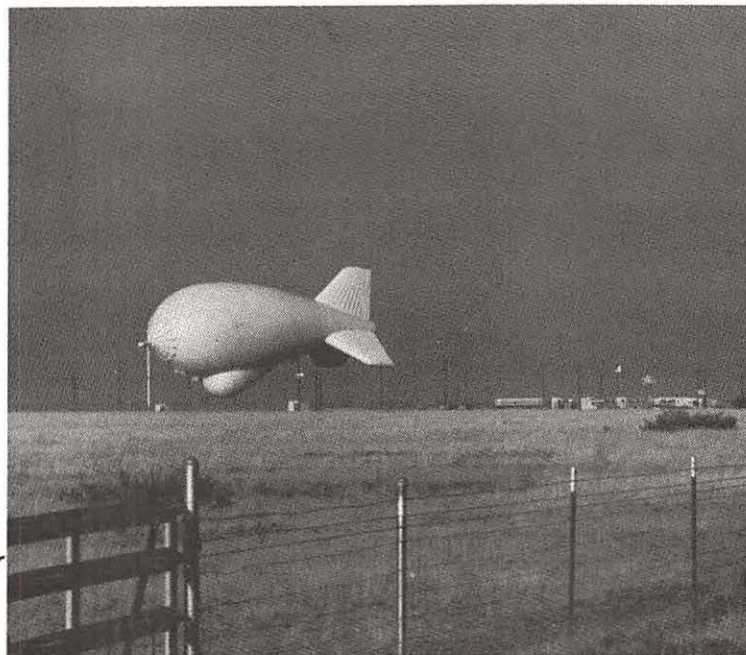
Many of the Fed File readers have a lot to say about what is going on out there in the world of federal monitoring and it is about time they had their chance. I will turn the column over to them this month. Provided below are excerpts (in their own words) of some of the better letters. They have been edited for length and clarity. Let's get to it.

Fed Expedition

Richard Ashley, a monitor who lives in Salt Lake City, Utah, wrote to tell of his radio expeditions throughout New Mexico and Texas. I'll turn the column over to Richard.

"Scanning the airwaves in northern New Mexico is where the federal monitor will find the airwaves filled with HF and VHF radio traffic. A stop near Los Alamos (home to many nuclear and Star Wars research facilities) provides fascinating radio monitoring. If you are travelling on I-40 near Grants, New Mexico listen in on the VHF low band frequencies (30-50 MHz). Located near Grants, is the Army's Fort Wingate military depot for special ordnance and explosives. Fort Wingate has tight security. This is where ordnance instrumental in the development of the atomic bomb is stored. More recently the 'Bunker Buster'

This floating radar platform photographed by Richard Ashley is used by U.S. Customs to detect drug smuggling over the Mexican Border.



bombs (used with great success in Iraq) were tested and developed at Wingate as well.

"Further south in the sprawling metroplex of Albuquerque, the scanning action is hot and heavy. Albuquerque is home to Kirtland Air Force Base and Sandia National Laboratories. At Sandia a great deal of nuclear energy and weapons experimentation is undertaken by the Department of Energy. Many of the specially outfitted vehicles that are based at Sandia are equipped with HF SSB multi-frequency radios. Super secret test equipment, weapons and nuclear packages are transported to and from Sandia Labs in these specially equipped trucks. They are closely watched and tracked on the nation's highways by a sophisticated radio network.

"The trucks are usually free of any markings (no company name on the vehicle) and are in themselves deliberately inconspicuous to avoid any unwanted attention. If one knows what to look for, the trucks are easy to spot. The transmitting antennas are disguised, looking much like a luggage rack on the roof of the tractor. Often a small cylindrical hemispherical radome (8 inches high by 14 inches in diameter) can be seen.

"The vehicles are closely monitored from the time they leave Sandia and until they arrive safely at their designation. It is common to see them en route to other DOE installations and laboratories on I-40. Many of the trucks are en route to Amarillo, Texas (285 miles East of Albuquerque) where the DOE has the Pantex Plant, the final assembly point of all U.S. nuclear weapons.

"The trucks are not only in contact with DOE via HF SSB radio but also use a variety of frequency bands including VHF. Many times close coordination with federal and state agencies is needed and communications are established either by VHF radio or cellular phone. Because

of the possibility of terrorist action against the trucks they are escorted by unmarked DOE vehicles. Sometimes the escort will include local and state police in cars, trucks and helicopters. The DOE transport drivers are armed and the vehicle has special markings so it can be tracked easily from the air."

Richard goes on to say that his expedition took him down to Holloman Air Force Base near Alamogordo, the White Sands Missile Range and he finished his trip near Fort Bliss near El Paso, Texas. Richard sent along some frequencies and some pictures of a U.S. Customs Aerostat near Marfa, Texas. The Aerostat is a stationary floating radar platform the U.S. customs use to spot low flying drug smuggling aircraft trying to cross the Texas/Mexico border.

Monitoring Five Presidents

Steve Dooner, KCA6VB, was lucky enough to monitor what could only be called an historic event. Armed to the teeth with scanners, including a Bearcat 250, AOR 2500, PRO-32 and a PRO-2004, Steve listened in during the dedication of the Ronald Reagan Library located in the heart of Simi Valley, California. Steve goes on to say

"The library is situated on top of a hill in Simi Valley, just three miles from my home. Using a single Radio Shack discone antenna tied to all the scanners (except the PRO-32) I was more than able to pick up all the communications including portables and body mikes. The Secret Service was the most active, using 14 different frequencies. These included 122.850 ('Marine One,' the President's helicopter), 163.9125, 164.400, ('Papa') 164.800, 165.2125 ('Mike'), 165.2875, 165.375 ('Charlie'), 165.785 ('Baker'), 166.400 ('Romeo'), 166.4875, 166.5125 ('Sierra') 407.825, 407.875 (body mikes), and 415.700

NEW MEXICO FED FREQUENCIES

Los Alamos National Laboratories
frequencies reported: 32.020, 34.14,
40.45, 122.750, 122.800, 139.775,
140.680, 142.230, 148.470, 162.6125,
163.375, 164.100, 164.225, 164.275,
164.325, 164.350, 164.375, 164.400,
164.450, 165.2625, 166.250, 167.825,
167.850, 167.875, 167.975, 170.725,
171.200, 171.2625, 171.325, 171.385,
257.000, 315.100, 406.225, 406.375,
406.750, 407.175, 408.125, 408.175,
416.055
Sandia Labs, Albuquerque
122.750, 122.800, 122.850, 138.610,
139.030, 139.770, 140.625, 141.420,
141.680, 141.700, 142.250, 143.415,
143.910, 162.595, 162.805, 163.000,
163.790, 164.000, 164.125, 164.250,
164.300, 164.375, 164.425, 166.125
Kirtland AFB, Albuquerque
App/Dep: 301.500/ 124.400
316.700/127.400, 317.600/121.000
Tower: 257.800/118.300, 41.950
MAC CP: 349.400

("Foxtrot") which is the downlink from Air Force One. I was able to monitor the beginning of a phone call to a presidential aid in Washington from Air Force One before the signal was encrypted.

"The well known code names for the Reagans ("Rawhide" and "Rainbow") could be heard repeatedly as well as "Rough Rider," "Victoria Highway," and "Columbia." Any guesses who they are?"

Steven monitored the whole proceedings and had a front row seat on all the presidential action including a "man down call" — probably just a bystander with a bit of heat exhaustion from sitting in the hot California sun. Thanks for your report, Steve.

Janets Revisited

More mail speculating about the mysterious "JANET" aircraft operating out of McCarran Airport has been arriving lately. If you recall in Federal Files past, observant monitors noticed that unmarked airliners, callsign Janet, had been flying top secret missions out of that Las Vegas airport. Some say they are used to transport pilots and crews working on secret stealth aircraft out at Groom Lake, Nevada. Others say that the aircraft are used to ferry DOE personnel to nuclear arms test and production laboratories.

From overseas (Great Britain) comes a new perspective on the possible mission of the JANET. Paul Greenwood writes, "I am writing about the 737s staging out of Las Vegas as of late. Enclosed is a photo of a USAF T43A which looks remarkably like the ones in Las Vegas, white fuselage with red stripe extending to the tail fin. The picture was taken on one of its visits to USAF Greenham Common, Berkshire near Newbury in 1989. Aircraft serial number N57NJE is operated by Keyway Air Transport, a subsidiary of the World Corporation. The specialty of Keyway is flights on-demand and special contract

work. The T-43A is also listed as being operated by the Central Intelligence Agency, (though still under USAF ownership). If so, is Keyway working for the CIA, much like the secret CIA airline of the past *Air America*?

"The JANET 737s, (which might be USAF T-43As?) may be operated by Keyway Air Transport and possibly being used for CIA business. The aircraft in the photo is unmarked, (except for registration number) and has the same red & white markings of the McCarran JANETS. I'm going to conclude that the ones in Las Vegas are similar and possibly CIA operated under Keyway Air Transport." *Editors note:* F-117A pilots are shuttled to their Tonopah base from Nellis, AFB by an outfit known as Key Air.

Janet Numbers

Bill Prichard from Midland, Texas writes, "This is in response to the *MT* reader's letter concerning the 'secret government airline' in the Sept. 91 issue. This airline is a fleet of 737-200s owned and operated by EG&G (a nuclear research firm). The registration numbers of the "Janets" are, N4508W, N4529W, N4510W N4515W N7383E and N7380E.

"Flights are conducted in conjunction with research at the Nevada Test Site and can be monitored on normal ATC frequencies. A possible EG&G frequency is 153.025. A possible company frequency is 128.875 which is a jet fuel supplier."

Military BBS

Regular contributing writer Steve Douglass has started a BBS (Bulletin Board Service) in conjunction with his monthly *Intercepts* newsletter. It is a pay BBS and features the latest loggings by *Intercepts* subscribers, a military frequency search service and tips for the military monitor. The BBS is accessible to anyone equipped with a computer and a modem. You can leave electronic mail to other military monitors and get the latest military news on the system. You can even leave mail to yours truly, Rod Pearson. Cost is \$50.00 a year (which includes a subscription to the *Intercepts* newsletter, which alone is \$18.00 a year). If you only want to subscribe to the BBS it's \$45.00 annually. For more information send a #10 SASE to Intercepts, 6303 Cornell, Amarillo, Texas 79109.



Boeing T43A (737) photo by Paul Greenwood

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The FCC recently passed Docket 90-55 which for the first time allows a new codeless entry ham radio license of technician grade. Privileges 30 MHz and above - ALL modes! (Send SASE for copy of R.E. article)

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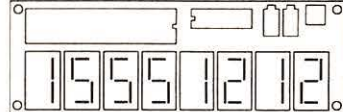
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Mapping Out Your Listening Strategy

As monitors, we are always on the look-out for more information to help us understand what we're hearing on our scanners and receivers. Learning to read the same maps and charts as the pilots and controllers use can be a big bonus. Although they are revised quite frequently, an annual purchase is enough for our purposes, and the cost is generally quite reasonable.

First an overview: Pilots rely on many different types of aero charts. Each is designed for several different uses and purposes. Some flights may require more than one type of chart for reference, depending on the particular flight. Pilots who fly mostly in rural areas will probably need only a very simple chart; commercial pilots and biz jet operators will need the full range of publications, charts and maps to ensure a safe and efficient flight.

Controllers also need up-to-date maps and charts—and not only those sector charts of their immediate operating environment. For instance, a controller who is working with a flight in trouble needs to have knowledge of the terrain and environment where the flight may have to put down if the pilot cannot make it to the nearest airport. So controllers need to have as such information available as possible so they know where to look for options and answers.

Sectional and VFR Terminal Control Area Charts

These are helpful to use when monitoring frequencies used by VFR (visual flight rule) pilots, such as UNICOM freqs at fixed base operations, transmissions to/from Flight Service Stations and others.

Sectional charts are designed for visual navigation of slow/medium speed aircraft. There are 38 sectional charts which cover the entire US. Scale is fairly large—1:500,000; one inch on the chart equals 500,000 inches, which converts to 6.86 nautical miles on the ground.

Terminal Control Area (TCA) charts are twice again the scale of sectionals so that they may include more detail, because pilots using them are flying in a high-density aircraft area. When you're monitoring tower, approach and departure frequencies, you'll see that TCA charts really come in handy!

Designed to show information that a pilot can use for visual navigation, Sectional and TCA

charts have highlighted visual checkpoints, such as rivers & creeks, populated areas, terrain & elevations, etc.

Airports are also well highlighted, with all essential information about each shown next to its symbol. This way, a pilot has immediate ready reference to necessary information. The charts show radio as well as visual aids to navigation, restricted areas, controlled airspace and other related data. Information such as the boundaries of TCAs is highlighted in different colors.

Enroute Low-Altitude Charts

You'll find these useful for monitoring low altitude ARTCC (Air Route Traffic Control Center) sector frequencies. Designed for flight under IFR (instrument flight rules) in the 'victor' airways up to but not including 18,000 feet, these charts highlight information absolutely essential to the IFR pilot. Examples of what you'll see on these charts include airways, limits of controlled airspace, position and identification of navaid frequencies, airports, minimum enroute & obstruction clearance altitudes, reporting points, special use airspace, etc.

Enroute High-Altitude Charts

I like to use these when monitoring high altitude ARTCC sector frequencies which work IFR aircraft from flight level 180 (eighteen thousand feet) and above. Although IFR pilots who mostly fly in high altitudes also need low altitude charts for departure/arrival phases, the high altitude charts are necessary for en-route procedures.

While containing the same type of information you'll see on low altitude charts, high-altitude charts are less cluttered. This is mainly because navaids and radio transmissions are generally received over longer ranges at higher altitude (Remember, the higher the flight, the further away we on the ground can hear them!).

Instrument Approach Procedures

These show the aeronautical data required to execute instrument approaches to airports in the US, Puerto Rico & the Virgin Islands. They include diagrams of airports located in the coverage area of each of the 15 volumes in the series.

Procedures are designated for use with specific navaids—i.e., instrument landing systems, VORs/VORTACs, nondirectional beacons (NDBs), communications information, airport sketches, etc.

Standard Terminal Arrival (STAR) and Standard Instrument Departure Charts

First of all, we have **Standard Terminal Arrival** (known as STAR) charts. These charts are for expediting ATC arrival route procedures and facilitate the transition between enroute and instrument approach operations.

Some of the names given to STARs are crazy but appropriate! For instance, there's the HEHAW arrival into Nashville International Airport and the GOOFY arrival into Orlando, etc. You'll see that these names almost always comprise five letters—no more, no less. Each STAR procedure is presented as a separate chart serving one or more airports in each geographic location.

Standard Instrument Departure or SID charts depict standard procedures for departing from a given airport and help furnish pilots with departure routing clearance info as well as easing the transition between takeoff and enroute operations. Strange names abound here too, such as Indianapolis' DAWN 1 departure. When a controller or pilot says it rapidly, it comes out sounding like the "Don Juan Departure"!

Airport Facility Directories

Each of the seven volumes in this series covers a specific area of the US. They contain information regarding airports and ATC information which is indexed by state and airport, navaid, & ATC facilities for the area covered.

Many other charts and maps are available, such as Helicopter Route Charts, the Alaska Terminal Publication, VFR/IFR (Preflight) Planning charts, and miscellaneous publications too numerous to mention here. If you also monitor the HF aero bands, I would suggest you obtain the North Atlantic and Pacific Route Charts. These are published for air traffic controllers and air/ground radio communications enroute operators (i.e. ARINC) who monitor transoceanic flights.

"Okay," you say, "Now where can I buy these great charts and publications?" Check in the phone book for a general aviation service operator such as Combes-Gates, or Beechcraft, located at or near your local airport. They always carry a good supply. Then there's Sporty's Pilot Shop. They have all of the above charts & maps—and then some. You can call them at (513) 732-6560 for current prices and such, or write to:

Sporty's Pilot Shop
Clermont Airport
Batavia, OH 45103-9747

Be sure to ask for their catalogue. It's really an outstanding 'wish book' for all aviation enthusiasts!

Another source is the National Oceanic Service. Write to them for a complete listing of their publications including the ones mentioned above. Rumor has it that they will be moving to a new address soon, but the most recent one that I have for them is:

National Oceanic Service
NOAA, N/CG33, Distribution Branch
6010 Executive Blvd.
Rockville, MD 20852

There are other sources available. If you'd like more of these, drop me a line with an SASE, and I'll get them out to you.

Listening to Airline Ramp Frequencies

Since purchasing a scanner which receives the UHF band between 460.000 and 470.000, this writer has discovered a whole new area of listening. Airline ramps are generally found between 460.600 and 461.000, although there are some all the way up to 465.000 and above. Granted they are rather low-powered, but those of you who live 10 to 15 miles from an airport large enough to have at least one or two major airlines can listen to interesting (and often hilarious) transmissions on these frequencies.

What exactly will you hear? Plenty! Transmissions from airline ticket counters to and from the boarding areas; baggage handlers attempting to load bags, boxes, mail, etc., on the correct flights (sometimes they succeed!); airline operations talking with the catering and other departments (one such transmission heard involved the operations supervisor of a major airline canceling all meals on outgoing flights one day because roaches were found in the catering truck!); passenger service agents called to handle problems with passengers or problem passengers; requests from ramp supervisors for additional help to load heavily booked flights; the list goes on and on of the various transmissions you can monitor on the ramp frequencies. If your scanner can receive these frequencies, give 'em a try.

They're fun and can also be very educational...maybe too educational!

Readers' Corner and Company Frequencies

We've been getting an excellent response from readers who want to share airline frequencies from their areas with us. We'll run some of these in almost every issue if possible, so keep 'em coming, folks!

• From S.D. of the Kansas City area, here are some very active company freqs utilized at the Kansas City International Airport:

AMERICA WEST (CACTUS)	130.175
AMERICAN AIRLINES	129.200
CONTINENTAL	129.925
DELTA	131.450
NORTHWEST AIRLINES	130.850
SOUTHWEST	131.700
TWA AIRLINES - KANSAS CITY	
RAMP/GATE ASSIGNMENTS	130.325
MAINTENANCE COORDINATOR	128.900
UNITED AIRLINES	130.150
USAIR	130.075

• Bill Battles (East Kingston, NH) sent us an extensive list he and Bill Dickerman (Williamsport, PA) compiled for monitors in Pennsylvania and New England:

NEW ENGLAND EXEC AIR	(Hampton, NH)	128.825
UNITED AIRLINES		128.900
	(UA utilizes this freq. in PA)	
NORTHWEST AIRLINES		128.975 (Heard in PA)
PAN AM		129.025 (New York Operations)
TWA		129.100 (used in PA Airports)
BRITISH AIRWAYS		129.150 (NY/Boston Ops)
AMERICAN AIRLINES		129.200 (PA)
AMERICAN AIRLINES		129.225 (Boston Ops)
UNITED		129.300 (Boston Ops)
AIR CANADA		129.300 (used in PA)
UPS		129.425 (Manchester, NH)
CONTINENTAL		129.475 (used in PA)
UNITED AIRLINES		129.550 (PA)
AMERICAN		129.850 (NY)
FISH SPOTTER AIRCRAFT		129.925 (MAINE)
USAIR		130.100 (PA)
BAR HARBOR AIRLINES		130.150 (MAINE)
BUTLER AVIATION		130.250 (Boston Logan Ops)
CONTINENTAL		130.400 (Manchester NH Ops)
TRUMP SHUTTLE		130.750 (Boston Ops)
AMERICA WEST (CACTUS)		130.850 (used in PA)
JET AVIATION		130.950
	(Peterboro/Bedford, NH)	
TWA		131.050 (NY Ops)
PAN AMERICAN		131.375 (PA)
AMERICAN TRANS AIR		131.525 (nationwide ops)
PRECISION AIR		131.750
	(Boston/Manchester ops)	
DELTA		131.900 (utilized in PA)
FEDEX (FEDERAL EXPRESS)		131.925
	(Manchester, NH) -	

(FEDEX seems to use this freq in many locations across the country! - jb)

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Looks as if the 'two Bills' have been busy! Bill Battles also sends some HF LDOC frequencies from KLM's Amsterdam Base: 5532, 8924, 17940, 21923. He reports receiving a beautiful QSL from them with picture postcards of airliners in flight, a newsletter, and a sticker of a 747 with 'Fly KLM' on it. This goes to show that you can get QSLs from airlines, if you're really persistent. It took Bill two tries at it, but look at the goodies he finally received!

Thanks to S.D., Bill Battles, and Bill Dickerman for their contributions this month.

You Know it's Gonna Be a Bad Night, When.....

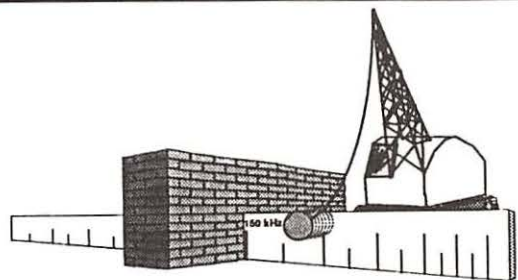
Last month, a Sabena Airlines DC-10 paid an unexpected visit to the Indianapolis International Airport. It was a dark and stormy night (no, this is not an introduction to a bad novel) when inclement weather at Chicago's O'Hare International forced a Sabena Airlines flight to make a fuel stop at Indy's American Airlines Operations. American handles Sabena at O'Hare and they called their Indianapolis counterparts to tell them the Sabena aircraft was coming in - about 20 minutes before the fact.

To make a long story short, the bad weather forced many other AA flights to divert to Indy that night (to say nothing of about 11 other airlines who had to do the same). When the Sabena aircraft arrived, they were told by American's Station Manager there was 'no room at the inn' and they would have to use American Trans Air's facilities. Naturally, the disgruntled Sabena Captain had no idea where Am Tran's gates were located (on the other side of the airport, naturally) and had to use a 'follow me' jeep to find it. It just wasn't his night.

Wow! we've had so much to tell you this month that there's no room for our usual photo. Next time, however, we'll visit the FAA Air Traffic Controllers Academy in Oklahoma City, camera in hand. Until then, 73 & out.



Breaking The 150 kHz Barrier



Remember the excitement of breaking the 500 kHz barrier for the first time? If you're ready for another conquest, you may want to check out the often neglected territory below 150 kHz. Although it's a bit harder to access, this region is brimming with many unusual signals, some of which you won't hear anywhere else in the radio spectrum.

Unfortunately, the lower limit of most worldband receivers is 150 or perhaps 100 kHz. I suppose this cutoff frequency is mainly a matter of economics. Since LF broadcasting (widely used in Europe) starts at 150 kHz, most manufacturers don't feel justified in adding the necessary circuitry to venture below this point. For the ute enthusiast however, the sub-basement holds many interesting challenges.

The biggest obstacle to enjoying the LF/VLF range is getting on the band in the first place. One way to extend the tuning range of your receiver is with an external converter. Many converters give coverage down to 10 kHz and can be easily switched out of the circuit to restore normal operation.

Another solution is to use readily available military surplus. The armed forces have long understood the value of the longwaves, and as a result, lots of top quality gear can be found on the surplus market or at swap meets. Some surplus receivers (such as the R-1401 A) will tune all the way down to 1 kHz.

A Quick Tour

What lurks in the sub-basement? Let's start at the bottom of the band and work our way up, sampling a few of the major players.

- At the rock bottom end of the radio spectrum, the Navy uses high powered transmitters on 76 Hz (yes, Hertz) to talk to submarines. This program is called Project ELF (extremely low frequency) and operates from two sites — one in Clam Lake, WI and another in Republic, MI.

Just to put it in proper perspective, ELF signals use frequencies that fall within the human hearing range. As such, your best bet for trying to hear them might be a tunable audio meter or amplifier.

Any red-blooded longwave listener would surely drool at the impressive antenna arrays being used for ELF. The Republic site uses a 56-mile long antenna constructed with 1-inch wire. The antenna is strung between nearly 1500 wooden utility poles. The antenna at Clam Lake is a still-impressive 28 miles in length. These

powerhouse stations are capable of reaching subs at depths of at least 400 feet.

- Between 10 and 14 kHz you should be able to hear several of the eight transmitter sites that make up the worldwide Omega navigation system. It's hard to miss these signals. They sound like a slow melody of different pitches, repeated over and over again. Besides the U.S. site in North Dakota, there are sites in Argentina, Australia, Hawaii, Japan, Liberia, and Reunion Island in the Indian Ocean. Perhaps you've heard Omega station status reported on WWV. These broadcasts announce when one of the stations is down for maintenance.

- Up to about 15 kHz, you may be able to hear one of radio's oldest mysteries—Whistlers. So named for their erie descending pitch, whistlers are frequently reported in the predawn hours often when distant lightning is occurring. Their exact cause is unknown.

- If you have a penchant for radio history, set your dial to 17.2 kHz once a month. The Swedish Wireless Museum fires up the last working Alexandrian Alternator on this frequency. I don't have a current schedule of operations for this station so I'd appreciate hearing from anyone who could shed some more light on this.

- The military dominates the 20 to 50 kHz range. Most stations here use CW or encrypted RTTY. In the U.S., the most common loggings are NAA, Cutler, ME (24 kHz); NLK, Jim Creek, WA (24.8 kHz); NSS, Annapolis, MD (21.4 kHz); and FXL, Silver Creek, NB (48.5 kHz).

- At 60 MU is the U.S. time station, WWVB, Ft. Collins, CO—you guessed it, this is the sister station of well known WWV. Many time stations throughout the world use LF to minimize propagation delays that can occur on HF. WWVB operates continuously using a specially-coded time signal (no voice). The main users of this service are the power utilities (to monitor AC line frequency), the scientific/research community and others requiring an extremely accurate time and frequency standard.

- The LORAN (Long Range Aid to Navigation) system of North America has been active on 100 kHz for many years. Its wideband pulsed signals can be heard many kHz above and below the assigned frequency. If you live near any of the coasts or the Great Lakes, you should have no trouble hearing LORAN signals.

Identifying What You Hear

The majority of stations below 150 kHz use

CW at least some of the time, but several use encrypted RTTY or other data formats that can't be readily decoded by the hobbyist listener. Sometimes it takes a little detective work to verify what station you are hearing.

A reliable frequency list such as the *Grove Shortwave Directory* comes in handy for a positive ID. The Directory has a complete listing of longwave utes from the sub-basement ELF stuff right up through the beacon band. If you're hunting for LF time stations, the *World Radio TV Handbook* is also a good place to turn.

Mailbag

Second-time contributor Terry Krey of Austin, TX, sent in some LF/VLF intercepts he heard using his R-1401 A/G receiver. Terry points out that the band really came alive during the Dessert Shield/Storm operation. Says Terry: "It sounded like 20 meters at prime time in the evening." He added that 20.27 kHz was especially hot. Here's Terry's impressive list:

FREQ (kHz)	STATION
10-15	All Omega Stations
20.27	Various military
21.4	NSS, Annapolis, MD
22.3	NWC, Exmouth, Australia
24.0	NAA, Cutler, ME
24.8	NLK, Jim Creek, WA
28.5	NAU, Aguada, PR
48.5	FXL, Silver Creek, NB
77.2	NAM, Driver, VA
100	LORAN, Raymondville, TX

On the European scene, Ary Boender writes from the Netherlands with his own list of basement loggings. He's using an FRA-7700 with active and wire antennas. Here are a few samples from Ary's extensive list:

FREQ (kHz)	STATION
14.5	HWU, Le Blanc, France
14.7	NPM, Pearl Harbor, HI
15.0	UIK, Vladivostok, USSR
20.27	ICV, Tavolara, Italy
21.37	GVA, London, England
23.0	UTR 3, Gorkiy Time Stn. (USSR)
68.9	XPH, Greenland - USAF
93.9	FUO, Toulon, France

That wraps up another month. Remember that your questions, comments and loggings are always welcome at "Below 500 kHz." Why not write today in care of this column? An SASE guarantees a response.



Improve Your Scanning Coverage!

GRE America is proud to introduce a new family of products to enhance your scanning pleasure! First, GRE has designed the new **Super Converter 9001** for base model scanners. The 9001 converts 810 MHz - 950 MHz down to 410 MHz - 550 MHz. The 9001 is the perfect alternative to buying a new, expensive scanner covering the 800 MHz band. Next, GRE announces the new **Super Amplifier 3001** for base model scanners. The 3001 will increase gain by as much as 20 dB, and is engineered to help scanners with low sensitivity pull in weak signals. Both products use BNC connectors, (1) 9 volt battery and have an off/pass switch for returning to normal operation.



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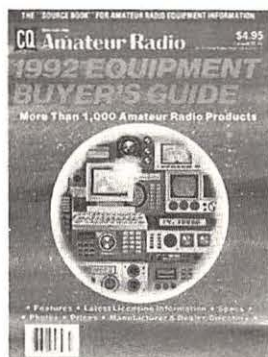
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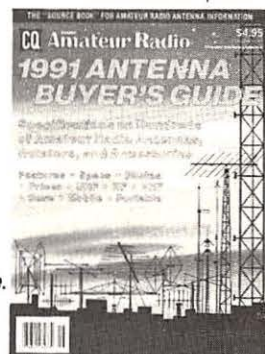


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A DXcellent Adventure, continued from page 26

At the hotel, 3000 feet of wire was directed towards Brazil, and a mini-Beverage of 400 feet was pointed at Europe. The remote site near the Renew's lighthouse had one 1275 footer aimed at North and East Africa and the Iberian Peninsula, and a 1000 footer for South and West Africa and the eastern tip of Brazil. Mark prepared a detailed computer study determining the correct bearing for each antenna's target area as a guide for their eventual construction on the Newfoundland coast.

By the time Mark arrived at the Renew's site, Jean and Neil had already logged and taped scores of African AM stations. Two receivers were being used, one in each car seat! Neil had an ICOM R-70, and Jean used the updated R-71, both running off the car's battery. As night fell, and darkness filled the path to the south, Brazilian stations began to appear from big cities like Fortaleza and Natal. The three medium wave explorers headed back to the hotel around midnight, ready to construct more antennas in the morning.

Heavy cloud cover, drizzle, and temperatures near freezing greeted the trio at sunrise Friday morning. Breakfast included a long discussion of DX strategy. *The World Radio and TV Handbook* was studied to create a "hit list" of African stations to look for in the afternoon and evening. A quick look around the band at noon revealed that trans-Atlantic reception of stations is indeed possible during daylight hours. The Azores was heard with good audio on 693 kHz, with signs of Morocco on 1044 kHz, and Portugal on 1035 kHz. A LORAN station, used for radio navigation for ships, broadcasting from Trepassey was leaking annoying spurs creating an annoying "tick-tick-tick" sound on lower medium wave frequencies.

Probably the most useful trick in identifying foreign stations en masse is comparing the sounds you are hearing on medium wave with parallel shortwave frequencies simulcasting the same programming. For example, if you think you may be receiving Gabon on 1554 kHz, check parallel 4777 kHz in the tropical band. If the audios match, you know what you're receiving without long periods of monitoring for verbal identifications. Mark used a modified Sony ICF-2010 for this purpose. A copy of the *WRTH* can be invaluable as a source for finding parallel frequencies! Also use their listings of the stations' slogans for added verification of your catches.

In the nights to come two teams were formed. Mark and Jean sat at the Renew's site logging a multitude of Africans, and Neil used the hotel site to log "bazillions of Brazilians." What were they hearing? Neil replied: "It's more like what we're not hearing. It's the most amazing reception I've ever had in my entire life. We got virtually every frequency that has a Brazilian graveyard on it, from 1450 to 1590. They all

run 250 watts at night, and we got audio on every one of them. We got one-kilowatts out of Angola, and tons of other stuff from Africa. On 1440 alone we got Luxembourg, Saudi Arabia, Central African Republic and Rio de Janeiro. It's unbelievable! Three nights in Newfoundland ran circles around two years in Maine. We logged 61 countries!"

The programming was nearly as remarkable as the reception. "The programming on some of those African stations is excellent," Mark noted. "It's really good music! Paul Simon has been getting involved with African groups, but this is where it's really coming from, like Nigeria and Niger. I just wanted to sit on some of those stations and boogie instead of moving to another channel. I like listening to the Caribbeans, too." Neil explained the sounds further. "It's very much like Tropical Band stuff. The Nigerians use heavily accented, very hard to understand English, and other vernacular languages. Jean can recognize many languages easily, so he was a big help in that regard."

An adventure in Newfoundland can include some risks. Mark, Jean and Neil tried to DX from the hotel, but found that the AC power lines were carrying noise creating intolerable interference. They immediately resorted to Jean's car. "When we moved my car away from the house, we overdid it. We had to boost (the battery) in the middle of the night. That's the hazard of the game." A day of DXing started at about noon and continued until 7 or 8 the next morning. They couldn't get enough!

Throughout their stay, their radios scanned the globe from Southern France to Colombia producing verified receptions from hundreds of stations. They left the area on Sunday "completely zorched by a combination of excitement and lack of sleep," Mark recalls. Although their achievements have become legendary, their experiences will become an inspiration to others.

The Best of the Amazing

All frequencies in kilohertz

850	Uruguay
870	Argentina
872	Mozambique
909	Nigeria
909.9	Gambia
1107	Egypt
1197	Lesotho (7200 miles!)
1296	Sudan
1313	Angola
1440	Central African Republic
1485	Ascension Island (100 watts)
1503	Azores (100 watts)
1521	Saudi Arabia

Neil agrees: "I hope the loggings I got from there will make the hobby more popular. Broadcast band DXing is not dead!"

A great fraternity of medium wave DXers exists all over North America. Neil, Mark, and Jean met each other through DX clubs specializing in medium wave DXing. If you would like to know more about the hobby, or a specific topic, these groups have enormous libraries of technical articles and lists to aid you. For more information, send an SASE to: The International Radio Club of America, 11300 Magnolia #43, Riverside, CA 92505, and The National Radio Club, P.O. Box 118, Poquonock, CT 06064-0118 today! Join the fun!

Bits n' Pieces

Rush to your television set! That's right! Top-rated talkshow host, Rush Limbaugh, will soon be the host of a syndicated daily television talkshow, raising eyebrows aurally and visually. Multimedia Entertainment is developing the program for the 1992-93 season, to be seen in most markets late at night. Mr. Limbaugh has been controversial from the moment he first embraced a microphone, and continues to be outspoken and the talk of most towns. Currently the host of his self-proclaimed Excellence In Broadcasting Network on radio, Limbaugh is heard on over 200 stations daily.

The National Association of Broadcasters is attempting to improve broadcasting in a slightly different way. Since the late 1960s, America has embraced FM as the place to find high fidelity audio and quality reception. Medium wave AM broadcasting became, in the eyes of the public, an inferior medium with monophonic audio and static. Over twenty years later, the NAB is hoping to change the image of AM radio by promoting a new line of receivers and antennas capable of high fidelity stereo reception. Now you can maximize your AM listening with "AMax!"

Home consumers will enjoy improved AM reception with advanced receiver features now familiar only to seasoned DXers. Adjustable bandwidth, noise cancellation circuits, stereo decoders, and provisions for external AM antennas are some of the highlighted features found in new "AMax" radios. Every receiver meeting the new standards set by the NAB will display an eye-catching "AMax" logo. Radio stations are airing spot advertisements promoting "AMax" equipment and dealerships nationwide. This may be the beginning of a new renaissance for the broadcasting band we grew up with!

Mailbag

February might be a cold month, but no one is as cold as WGCN disk jockey Charlie Bryan! Sealed inside a 5,000 pound block of ice for 48

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hours, Charlie shivered the time away in the showroom of Southern Motors in Savannah, Georgia, to raise money for a local Silent Witness anti-crime program. Local hypnotist "Dr. Silkini" put Bryan in a trance before he entered his ice cube. "If he had not had the relaxation methods I provided he'd be stark raving mad by now" Dr. Silkini insisted. A registered nurse was in attendance during the entire ordeal.

WGCO listeners could peer into Bryan's icy home through a hole bored in the ice adorned with a plexiglass sign reading "Look Here!" A television, a cellular phone, and a radio to hear his station were installed in the cube of ice to ease his stay. "Man, it's cold in here ... and reception is terrible!" Charlie complained. Selected by WGCO listeners to be the frozen guinea pig, Bryan survived the freeze unscathed! MT reader Robert Tucker sent in this frosty news.

New Station Grants

Do you still have empty spaces on your radio dial? Static will soon become sound in these cities: Baker, CA 101.5; Lenwood, CA 107.3; Coosa, GA 95.3; Westport, IN 91.5; Larose, LA 100.3; Ashley, MI 92.5; Blue Earth, MN 98.1; Eden Prairie, MN 105.7; Pelican Rapids, MN 104.1; Winona, MN 101.1; North Creek, NY 89.9; Oswego, NY 88.9; Beaver Springs, PA 106.1; Knoxville, TN 104.5; and Amarillo, TX 105.7. Courtesy of *The M Street Journal*.

For Sale

"Let's make a deal!" Bob Zellmer wants to become your Monty Hall this month! Become a partner, investor, or buyer of his 100 kilowatt station in the Northern Front Range District of Denver, Colorado, today! The facility features a transmitter site 1000 feet above average terrain. Bob can be reached at 303-330-1342.

Here's a chance to own a great property! A new 6,000 watt FM is for sale in Virginia. Serving a large and desirable market, it is currently bargain priced at \$395,000. Fax your replies to 803-297-7186.

An excellent starter station is now available in Colorado. Located in a profitable resort market, this 10 kilowatt AM outlet has plenty of potential for an owner/operator, or as a family business. Call Clifton Gardiner and Associates for details: 303-949-4485.

International Bandscan

Evangelist Dr. Gene Scott continues to upgrade his stations around North America. Scott recently made a downpayment of \$55,000 toward new custom built shortwave transmitters

to be installed in 1992 on the Caribbean island of Anguilla. Nearby medium wave outlets carrying his broadcasts will also see improvements

soon. "The Caribbean Beacon" on 690 kHz will rise from 15 to 50 kilowatts, and alternate frequency 1610 kHz will double in power from 50 to 100 kilowatts. The 1610 kHz frequency is currently an unusually clear channel making nightly reception of "The Caribbean Beacon" possible worldwide. Scott has dubbed his project "Secret" to thumb his nose at the devil!

Famous Radio Luxembourg has ceased its English transmissions on 1440 kHz ending 58 years of broadcasting on the frequency. An estimated 2.8 million people in Great Britain listened to "Lux" every night, with another 1.8 million tuning in via the Astra satellite. The *Daily Telegraph* reported that Radio Luxembourg wanted to close down the service because "fading and crackling signals have given the station an antiquated image we want to be rid of." Many rock groups, such as The Beatles, made their broadcast debuts via their powerful transmitter on 208 meters (1440 kHz). Before the advent of rock n' roll shows via Radio Caroline or BBC Radio One, Radio Luxembourg was the only place Britons could hear pop music on their radios. English broadcasts will continue to be heard via satellite and on 15350 kHz shortwave.

The residents of Prague, Czechoslovakia have a new FM outlet to listen to. Bonton Radio is now heard daily on 99.7 MHz. Radio Estonia has begun a new DX program in English broadcast on the first Monday of each month using 1035 kHz, with a shortwave parallel of 5925 kHz. The first program reported the demise of the pro-communist Radio Nedezhda, and the start of a new local station, Radio Tartu on 69.62 MHz.

YLE, Radio Finland, is heard daily in English on 558 and 963 kHz. Look for their transmissions at 0730, 1930 and 2230 UTC. Africa Number One, a popular radio service broadcasting from Gabon, is now being relayed, via satellite, to Parisians on 107.6 MHz FM. Their transmitter is located high atop the Eiffel Tower.

Credits

Many thanks to extraordinary DXers Mark Connelly, Neil Kazaross, and Dr. Jean Burnell. Readers Ron Carruthers, Bill Cain, Robert E. Tucker, W. Earle Doan, Ed Bugliarelli, Edward Bennett, Keith Lewis, Hugh Miller, and Richard Molinar provided additional materials. Also, thanks to *Broadcasting Magazine*, *London's Daily Telegraph*, and *The M Street Journal*.

Have a happy Ground Hog Day, and happy trails!



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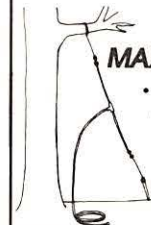
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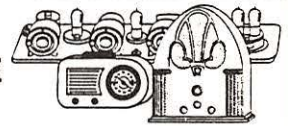
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The Sony ICF-2010 (Price \$349.95 -- Shipping \$7.50)

Portable shortwave receivers are a hot item in today's frenzied radio market. The 2010 keeps with the times by giving you exactly what you want, an all-round, wide range receiver with frequency ranges from 105kHz-30MHz, 76-108 and 116-136MHz. The 2010 also hosts some unique features such as direct-access to your favorite stations and 4 automatic on/off cycles per day for frequencies and times of your choice. This full-featured portable is sure to give you the quality you want and deserve. (Retail \$459.95)

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From its wide frequency range to its 200 memory channels, this is one handheld that is out to please the world. This impressive new wonder hosts frequency ranges from 30-54, 108-174, 380-512 and 806-960MHz (excluding cellular, restorable). If it's speed you want, the 35 channels per second should satisfy even the hungriest enthusiast's appetite. Its full sound makes every channel a pleasure and the choice of using the included NiCads or your own disposable AAs, the options on this portable powerhouse make it a sure winner. Now from Grove for only \$289.95 with 6 FREE NiCad batteries and a FREE AC wall adaptor/charger. (Retail ~~\$321.97~~)



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New

The New Hams

Prior to the 60's most amateurs were former SWL's and had acquired a lot of information about how QSO's (contacts) were to be conducted simply by listening to hams talking to each other. Today's new amateur normally gets into the hobby via CB, or purely through interest in the hobby of talking to others on a radio. Few new hams are former SWL's, and as a result have no knowledge of how to go about conducting a QSO.

To be sure, after purchasing a new rig it does not take too long for the neophyte to acquire a rudimentary ability to carry on a QSO on FM or SSB. All one need do is listen to the goings on and mimic them (not always a good idea).

Many older hams resent the CB practices that have infiltrated the bands. I must admit that hearing "I gotta copy on ya" wears thin rather rapidly. However, to be fair we must admit that most newly licensed amateurs have had a great deal more exposure to CB than to ham radio. Consequently they will add their favorite practices to the hobby as every generation of amateur has since the hobby started.

What is Right?

In general, if you are talking to a local friend you will both understand each other even if you speak pure CBese. But to be sure that everyone you contact can understand, speak English just as you would with your family or the people you work with. There is no need to spice the conversation up with exotic radio terms, CB or otherwise.

One of the more prevalent practices among the amateur community is to use Q signals on radiotelephone, for example, "QSL that," instead of "OK, I understand" or more properly, "roger." Q signals were designed to be used while operating Morse to enable all operators (regardless of the language they speak) to communicate with one another.

How to Initiate a Contact

Repeaters—Announce the fact that you are monitoring the channel, by saying "N3IK monitoring" (or listening). It is a good practice to state the last three digits of the frequency you are monitoring; for example "N3IK monitoring 255" in this case 255 stands for a favorite repeater (147.255). Stating the numbers will allow a station in the scan mode to go to your exact frequency without the need to check the display on the rig.

SSB or AM phone—Simply call "CQ CQ CQ from N3IK." Repeat this two or three times, then say something like "N3IK listening." Very often an operator on SSB will simply pause every few seconds while calling CQ and allow his VOX (voice operated relay) to switch to the receive position. Then all you need do is answer him (e.g., G3PQQ this is N3IK do you copy?)

Of course, the alternative is to answer a station calling CQ rather than initiating your own.

One thing that is very important in phone operation is the use of phonetics. Use standardized phonetics for your call, unless you have very distinct and recognizable phonetics (one that comes to mind is K3MM who uses Mickey Mouse).

CW—Again call CQ CQ CQ de (your call) and repeat two or three times. Use the prosign K to indicate that you are waiting for a call (e.g., CQ CQ CQ de N3IK N3IK K). Or, as on phone, answer a CQ.

What About Q Signals and Abbreviations?

Morse operators use a sometimes bewildering array of abbreviations and Q signals during the course of a contact. Do not expect to understand all of them at once. As you gain experience they will become familiar. When you first start operating Morse, use plain language and listen to what the other operators are doing. Ask them if you do not understand; that is one way of learning.

Q signals are special signals that mean the same thing, no matter in what language a Morse operator is conversant. For example, QRM means "another station is interfering with your signal." Sending that particular Q signal will be understood by any Morse operator regardless of his native language. There is an extensive list of Q signals, but hams use only a dozen or so of them in normal day-to-day operating. There is no need to study the list and become familiar with all of them—in time you will understand the commonly used ones.

Punctuation seems to worry too many new CW ops. Forget it; the only punctuation you will need is the slant bar and an occasional comma. There is nothing more boring than listening to someone put in every punctuation mark. The average contact does not use punctuation! No fooling—hearing something like this is normal, and every one understands: "hi joe psed to meet

u name is ike and qth is brasstown nc trying new ant so wud like sig rpt gotta run sn cuz must take yf shoppin k"----

Translation - "Hello Joe, I'm pleased to meet you. My name is Ike and my location is in Brasstown, North Carolina. I am trying out a new antenna and am anxious to know how you are copying my signal. I can't stay too long because my wife wants to go shopping. Go ahead--"

No matter what mode you use, the important thing is to listen first. Now that does not mean listen for weeks before transmitting. Just listen for a few hours to get the feel of hamming then "DO IT"! Don't be concerned about making mistakes; everyone does, that's how we learn!

Book Learning

There is a manual available that will help sort out the mysteries of correct procedure no matter what mode you choose. It is the *Operating Manual* and is available from most ham stores or the ARRL at 225 Main St., Newington, CT. 06111.

In addition, I would suggest you join the ARRL. Membership entitles you to receive their excellent magazine *QST* and many membership services such as the out-going QSL bureau and much more.

Mir Speaks

The hams aboard the Soviet (Russian) space station Mir have been making many impromptu contacts; in fact, they have joined nets and gotten on repeaters. In general the Mir crew has been having fun surprising a lot of hams by calling on frequencies all over the FM subband on two meters. Be aware of this and keep the scanner running during their passes.

U2MIR was reported to be in the hospital due to latent affects of his extended stay in weightlessness. Musa is responding to treatment and we hope will be out of sick bay and back on the job soon.

Packet Primer

Larry Kenny, WB9LOZ, has produced an excellent manual on operating packet for the beginner. The original manual was comprised of a series of packet messages sent via the packet bbs. Amateurs all over North America acclaimed Larry's tutorials. Many of us made copies for our

Pol Serrano's

Ham DX Tips

This looks like a good month for those who DX the ham bands, with several DX-peditions to rare locations and plenty of X to look for, but to log it you first have to know where to look:

ALBANIA-ZAITAG (Beri, Box 66, Tirana, Albania) has been offering country to the CW fans on 14005 kHz at 1300 UTC daily.

ASIAN DX TOUR DL2GAC (Bernhard Stefan, Aachstr 25, D-772 Uhldingen 1, Germany) will be making a DX tour of Asia and the Pacific for the next few months. His itinerary for the next few weeks is known and follows: *India* January to 15 February as VU2BMS, Maldives on 16 February only. *Singapore* For a few weeks starting 17 February as 9M2QR. Since he will be operating from islands from each country he visits, he will be on the International Islands On the Air (IOTA) net frequencies of 14160, 21260 and 28460.

BAHAMAS KM6E/C6A (Daniel L. Brandt, 1201 N. Kensington St. 5, Arlington, VA 22205) will operate from here for two weeks in March starting around the 18th. Send reports to his home address.

CANADA VE3FQ who is station manager for the Ontario DX Association's club station VE3ODX has advised us of correct info for their club station. You may remember in the December column we ran a tip on VE3ODX. If you are looking for that station, try their Sunday net on 7068 kHz SSB at 1700 UTC. The address for reception reports is P.O. Box 161, Station A, Willowdale, ON M2N 5S8. At that time of day propagation for this frequency will only allow reception in Ontario and adjacent areas.

EL SALVADOR YS1DRF has been on the 17 meter band frequency of 18130 kHz SSB daily at 0000 UTC. Send reports to his QSL manager W2PD, Saul Slonim, 320 Rose St., Massapequa, NY 11762.

ISRAEL The new prefixes being assigned for amateurs here start with 4Z5.

LESOTHO You can log this one by looking for 7P8SR (Box 233, Maseru 100, Lesotho) on 30 meter CW 10101 to 10110 kHz between 0200 and 0400 UTC.

PHILLIPINES A special amateur station operates in February to celebrate 50 years of broadcasting by the Voice of America. 2G2VOA (QSL to John Vugteveen, W7KNT, Box 64, Stevensville, MT 59870) 14025 kHz for CW and 14225 kHz are likely frequencies of this operation.

QATAR A7IBS (Khalifa, Box 1556, Doha) has been 21250 kHz at 1700 UTC. A71CH (Khalid, Box 11566, Doha) 28460 kHz at 1300 UTC.

REVILLAGIGEDO XF0C (reports go to Hector Espinosa Flores, Box 231, Colima, 28000, Mexico) will be active as a special DX-pedition operation February 4th to 19th. The operation will have two complete stations operating on SSB, CW, and RTTY on the bands 60 to 160 meters. The usual DX freqs (1833, 3505 CW, 3795 SSB, 7065 SSB, 7005 CW, 1025 CW, 14145 SSB, 21025 CW, 21295 SSB, 28025 kHz and 28495 kHz or 28510 kHz SSB)

SOUTH ORKNEY IS VP8CFM should be active at this time on RTTY check 14080 to 14100 kHz. QSL to GM4KLO, Michael Mistofsky, 25 Broomcroft Rd., Newton Mearns, Glasgow, G77 5ER, Scotland, UK.

VIETNAM SM7NFB will be in Hanoi for one year and a half. He prefers SSB to CW and says the frequencies he has been assigned are: 14030 CW, 14195 SSB, 14240 SSB, 21030 CW, 21200 SSB, and 21295 SSB. QSL to SVARK, P.O. Box 20235, S-56102, Huskvarna.

Good hunting and 73 de Rob.

friends who were thinking of getting on packet.

Now "Renaissance Software Library" has made this popular tutorial available on disk. The tutorials are a series of ASCII files and can be printed by using any text editor and most word processors (I used the simple "Text" word processor that came with my Tandy 2500).

These tutorials are excellent, for beginner or old timer alike. Larry uses plain language and

explains in superb detail everything you need to know about packet.

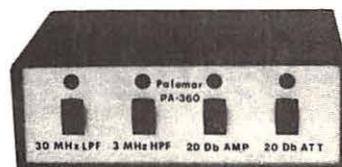
To order your copy call 1-800-525-7235; price is about \$5.00 including shipping and handling (ask for their catalog!!)

QRT CU SN

73 de N3IK

mt

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See review, January MT p. 104. The updated version advertised above incorporates several new features.

Copying Fax

From their letters, it appears that a few FAX enthusiasts are having problems. Hugh Hawkins sent in a FAX photo that appears to be a mirror image (see Fig 1). In fact, if you look at the photo in a mirror, it looks OK! The problem is caused by either the improper setting of the nor/rev button on his M7000 or his receiver is probably tuned to LSB.

He also said that while he copied the FAX, he heard a high pitched whine coming from the receiver that caused a shading in the photo. I believe he was copying a heterodyne which is a carrier from another transmitter that is close in frequency. Because the BFO of the receiver is turned on, the interfering carrier creates a pitch that is usually higher or lower than the received signal. Ham radio operators using "single side band" have the same problem with AM broadcast stations on the 40 meter band.

The problem can be eliminated by turning on the notch filter on your receiver. Then carefully tune the notch adjustment slowly until the tone is eliminated. Hugh apparently made the adjustment on his R71 after 2/3 of the photo was copied.

Hugh also complained about the fuzziness and the heavy lines in the charts. I guess that's because "what you see is what you get!" I've never seen an actual chart but I believe a great number of them are using a marking pen. Before being FAXed, others are created using a plotter.

These charts were copied using a dot matrix printer. A modern day FAX machine uses a laser scanning system that generates high quality photos. But only the Weather Bureau can afford equipment like that! I was able to get a little better quality using my Tandy computer, a Universal M1000, an IBM desk jet printer and an Icom R71A (see Fig 2).

If you have FAX photos and/or weather charts, please send them to the RTTY column. You'll have a chance to show them off and share your hobby with others.

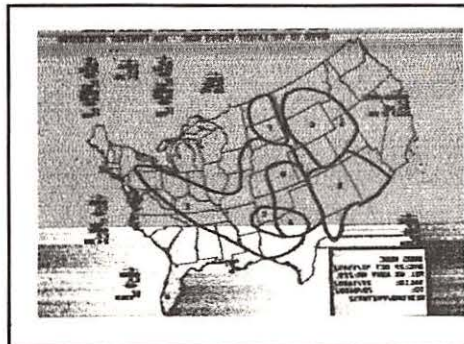


Figure 1

Top 20 FAX Frequencies

FREQ	LPM	IOC	CALL	LOCATION	SERVICE
3357	120	576	NAM	NORFOLK	WX
4704	120	576	AOK	ROTA, SPAIN	WX
6330	120	576	CFH	HALIFAX, NS	WX
6850	120	576	WLO	MOBILE, AL	WX
6872	60	288	LRB79	BUENOS AIRES	PRS
6944	120	576	CKN	VANCOUVER, BC	WX
7530	120	576	NMF	BOSTON, MA	WX
8080 *	120	576	NAM	NORFOLK, VA	WX
8682	120	576	NMC	SAN FRANCISCO, CA	WX
9157	120	576	WLO	MOBILE, AL	WX
10535	120	576	CFH	HALIFAX, NS	WX
10677	60	288	LRN2	BUENOS AIRES	WX
10863 *	120	576	NAM	NORFOLK, VA	WX
13751	120	576		LONDON, ENG	PRS
14828	120	576	NPM	PEARL HARBOR, HI	WX
16410	120	576	NAM	NORFOLK, VA	WX
17585	120	576	AOK	ROTA, SPAIN	WX
17670	60	288	LQZ67	BUENOS, AIRES	PRS
18431	60	288	LRO83	BUENOS, AIRES	PRS
22542	120	576	JJC	TOKYO, JAPAN	PRS

* = ON 24 HOURS WX = WEATHER PRS = PRESS

FLASH! PK232 Users

The following was taken off of a computer BBS and sent in by Ted Hay: If you're noticing a slight self-oscillation in your PK232's audio circuit (it's usually noticed when you're using a tuning scope), add a .0015 capacitor across R80 on the main circuit board. The "mod" improves the weak signal reception.

Another "mod" that improves weak signal performance involves a more drastic change.

There is a problem whereby noise on the power bus of the PK232 can be seen on pins 4 and 11 of the audio op-amp chips. The modification involves the addition of 1uF capacitors

across pins 4 and 11 of U23, 26, 28, 30, 32, and 34. Ted claims that "the mod cleaned up some of the noise that was seen on his mark/space oscilloscope cross-display" and "he can copy signals that don't even raise the S-meter."

The "mod" requires that you completely disassemble the PK232 by removing the main circuit board and solder the capacitors on the bottom. I think, if you're careful, you can do the job on the top without the complicated PCB removal. If you're using polarized capacitors, just make sure that you place the plus (+) lead on pin 4 and the minus (-) lead on pin 11.

Still being careful, you can solder the "caps" directly to the IC legs. But if the heat from the soldering iron is held for a longer than 15 seconds, you can damage the chip. BY THE WAY!!! DISCONNECT THE POWER FROM THE UNIT BEFORE YOU EVEN REMOVE THE COVER.

Another bulletin recommended that you place .1 uF and 1 uF capacitors across pins 4 and 11, but I think that's a bit of overkill. After working with digital circuits for several years, I found out that unless you're working with high speed logic and high frequency audio circuits, adding more capacitors only increases the possibility of damaging the board. The 1 uF caps will work just fine especially if you use the tantalum variety. You can find them at Radio Shack.

NNN

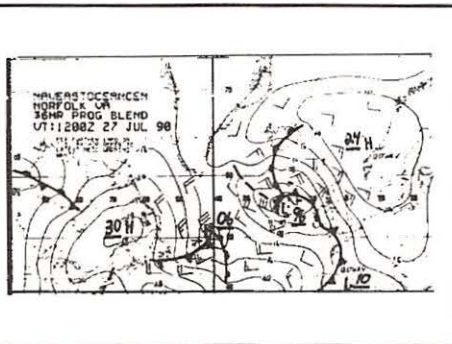


Figure 2: An HP Desk Jet Printer generates better resolution than a dot matrix printer.

QSL Service

ODXA, the renowned Ontario DX Association, has once again pulled off another coup in the shortwave listening world.

The ODXA has now become QSL Manager for stations CFRB 1010 AM and CFRX 6070 kilohertz.

According to veri signers Stephen Canney and John Grimley, the management and engineers are "thrilled to have us take over the QSLing duties."

The DX club replies with a QSL card, station information sheet, and an ODXA brochure. Your reception reports should be sent to ODXA, Box 161 Stn. A, Willowdale, Ontario M2N 5S8, or FAX your details to the club line 416-853-3169.

Don't forget to include return postage!

MacDill AFB "Certificate of Acknowledgement."



AIRCRAFT TRAFFIC

Honolulu ARINC, 10048 kHz USB. Full data letter verified by Duane W. Lighty, Mgr. Air-Ground Operations. Received in 30 days for an English utility report and mint stamps. Aircraft address: Aeronautical Radio Inc., 2668 Waiwai Loop, Honolulu, HI 96819. (Bill Battles, East Kingsport, NH)

Coast Guard Rescue 1501 (HC-130H), 5696 kHz USB. Full data prepared QSL card verified by Daniel R. On, AT2. Received in 7 months for an English utility report for a prepared QSL card, and mint stamps. Aircraft address: Aircraft Commander, CG Aircraft 1501, CGAS Elizabeth City, NC 27909-5004. (Preston Sewell, Franklin, NJ)

CANADA

Trenton Military, 6753.0 kHz USB. "Confirmation prohibited" form letter from Canadian Forces Communication Command, signed by Cpt. A.C. Neil. Received in 30 days for an English utility report, shortwave station card, a prepared QSL card, and one IRC (returned). Station address: Canadian Forces Base Trenton, OIC/ NCOI Communications, Astra, Ont. KOK 1B0, Canada. (Sewell, NJ)

COSTA RICA

Adventist World Radio (TIAWR), 9725.0 kHz USB. Full data letter signed by David L. Gregory-General Manager. Received in 110 days for an English report, shortwave station card, a prepared QSL card, and two IRCs. Station address: Apartado 1177, 4050 Alajuela, Costa Rica. (Sewell, NJ)

CZECHOSLOVAKIA

Radio Prague International, 7345 kHz. Full data color scenery card, with illegible veri signature. Received in 19 days for an English report. Station address: English Language Service, Vinohradska 12, 120 99 Prague 2, Czechoslovakia. (Nicholas P. Adams, Newark, NJ)

PORTUGAL

Radio Portugal International, 9705 kHz. Partial data QSL card, and station souvenirs, without verification signer. Received in 64 days for an English report and mint stamps. Station

address: Rua de S. Marcal, 1-B, 1200 Lisboa, Portugal. (Doug Merkel, St. Louis, MO)

SHIP TRAFFIC

M/V Liberty Star, 9043 kHz (SRB recovery vessel). Full data prepared QSL card, verified by Master John Lischbech. Received in 9 days for an English utility report, and mint stamps. Ship address: c/o Captain M/V Liberty Star, Thiokol Maritime Operations, Hanger AF, TH1-705, Kennedy Space Center, FL 32899. (Battles, NH)

USS Trenton (LPD-14), Mars Station NNNOCOW, 20936.0 kHz USB. Postcard QSL with photo of USS Trenton, and "Welcome Aboard" brochure, verified by Lt. J.L. Caruso-OIC Mars. Received in 30 days for an English utility report, SWL station card, and a stamped-self-addressed envelope. Ship address: USS Trenton (LPD-14), Atten: OIC/RMC-Mars Communications, FPO NY, NY 09588-1716 (Sewell, NJ)

ACTUARIA-9VJT, 500 kHz (Container ship). Full data letter verified. Received in 56 days for an English utility report, and one U.S. dollar. Ship address: Peter, SCHIFFAHRTS G.M.B.H. & Co., KG, Dohle, Palmaille 33, Postfach 500 440, D-200 Hamburg 50, Germany. (Hank Holbrook, Dunkirk, MD)

KENTUCKY-H9GK, 12255 kHz (Tanker). Full data prepared QSL card verified. Received in 30 days for an English utility report and mint stamps. Ship address: c/o Marine Transport Lines, Inc., Meadowland Plaza, 150 Meadowland Pkwy., P.O. Box 1550, Secaucus, NJ 07094. (Holbrook, MD)

SWITZERLAND

Swiss Radio International, 12035 kHz. Full data Anniversary QSL, with note from veri signer Gillian Zbinden. Received in 25 days for an English report and one IRC. Station address: Swiss Broadcasting Corp., CH-3000 Berne 15, Switzerland. (Adams, NJ) (Rose Carmine, Sidney, OH)

UNITED STATES

Voice of America, Bethany Relay Station, 9575/17800 kHz. Full data 50th Anniversary QSL card, verified by John Vodenik. Received in 6/10 days for an English report. Station

address: Bethany Relay Station, P.O. Box 227, Mason, OH 45040. (Adams, NJ)

WHRI, 13760 kHz. Full data "Shepherd's Chapel" QSL card, verified by D.A. Gifford. Received in 14 days for an English report. Station address: Dr. Arnold Murray, Shepherd's Chapel, P.O. Box 416, Gravette, AR 72736. (Adams, NJ)

Voice of Free China via WYFR, 11580 kHz. Full data QSL of Art Works by Orphans, without verification signer. Station souvenirs, magazines and program schedule included. Received in 30 days for an English report. Station address: P.O. Box 24-38 Taipei, Taiwan, Rep. of China. (Adams, NJ)

Radio New York International via WRNO New Orleans, 7355 kHz. Full data QSL card and station information sheet, verified by Tina Shield. Received in 77 days for an English report, one dollar, and a self-addressed-stamped-envelope. Station address: RNI, P.O. Box 270, Flushing, NY 11352. (Battles, NH)

MacDill AFB, 8993.0 kHz USB. No data "Certificate of Acknowledgement", signed by Robert Smith Jr.-Chief Radio Operator. Received in 150 days for a utility report, a prepared QSL card, and mint stamps. Base address: MacDill AFB Communications, Atten: OIC/NCOIC-Global Command & Control System, Tampa, FL 33608. (Sewell, NJ)

USCG Communications Station "NMN" Portsmouth, Va. 12718.5 kHz USB. Full data prepared QSL card and station card, verified by RM/QSL Manager W.D. Bankston. Received for a utility report, and a prepared card. Station address: Dept. of Transportation U.S. Coast Guard, Commanding Officer, USCG CAMSLANT-NMN, c/o NAVSECURACT Northwest, Chesapeake, VA 23322-2598. (Don Loebel, Palm Springs, FL) Don notes that QSL Manager said, "We QSL 100%". -Ed.

USSR

Radio Moscow, 11710/9685/ kHz. Full data color scenery cards, and reception report forms, without verification signer. Received in 36/ 88 days for an English report. Station address: North American Service, Moscow, USSR. (Adams, NJ) (Sam Wright, Biloxi, MS)

MONITORING TIMES

February 1992

Still Going! Like that darn Energizer rabbit with the drum, the things will not go away. Of course we are talking about shortwave's still biggest mystery, the numbers stations. In West Virginia Dwight Weidman found an interesting situation on 7423 kHz. He came across a 4-digit group Spanish numbers transmission from 2325 until 2335, with carrier continuing until 2337. After that music from one of Radio Moscow's regional transmissions appeared on the frequency!

Speaking of Moscow, some suspected the collapse of the Soviet bloc would mean the end or at least a drastic reduction in numbers activity. This is definitely not the case. Monitors on both sides of the Atlantic are still reporting extensive loggings. If you are not familiar with the numbers, then you might want to try for one of the most infamous and best known of all. This is the 0230-0240 UTC four-digit Spanish numbers transmission on 6840. Monitors have good reason to believe this one originates from highly-restricted government facilities in Warrenton, Virginia. However, is this true every day? Any numbers experts out there want to express an opinion on this? How about it, Havana Moon?

One person who is definitely convinced numbers traffic is not slowing down is England's Simon Mason. He is the author of the new book *Secret Signals: The Euronumbers Mystery*. If you were to buy only one radio book in 1992, then maybe this should be it. Mason is superb at what he does and takes you on a not soon-to-be-forgotten encounter with the Lincolnshire Poacher, Bulgarian Betty, Papa November, and other equally mysterious things which go bump in the night. While he puts a European slant on the numbers, many of the stations he covers have

been regularly heard in North America. There is also an extensive frequency list.

The book is \$9.95 plus \$2.00 shipping (\$3.00 foreign) from Tiare Publications, P.O. Box 493-MT, Lake Geneva, WI 53147. It is the perfect companion to the classic *Uno, Dos, Cuatro: A Guide to the Numbers Stations* by Havana Moon, and also available from Tiare for \$13.95 plus 2.00 shipping.

While on the subject of "spy numbers," a possibly related article by Larry Luxner appeared in a recent edition of the biweekly Washington paper *Times of the Americas*. In writing about Castro's heavily guarded Museum of State Security in Havana, Luxner notes one exhibit features a SONY ICF-7600D shortwave radio. The Cubans claim it was used to "facilitate secret CIA transmissions." Beside it is "an artificial, hollowed-out rock supposedly used to deposit codified data."

Bringing up the numbers tends to bring up a variety of other oddities. At the MT convention in Knoxville, Larry Van Horn brought to my attention the notorious "water drip" on 6761 kHz. I have managed to log it several times since. Although not personally heard by him, John Demmitt advises that on one occasion the water drip and a numbers transmission were on the frequency at the same time. However, what this sound actually is remains another one of those unanswered questions.

And those single letter high frequency beacons also are still around. Dwight Weidman logged "P" on 4031, which normally is a MARS frequency.

So you can see, the oddities have not gone away. And perhaps they will yet be our downfall. As Tom Kneitel once remarked, "Truly we radio

folk ARE the people our parents always warned us about."

Clandestine Bust: From Terry Krueger and *DX South Florida* comes a report that the FCC has raided and closed an anti-Castro clandestine station operating on shortwave. This was La Voz de Federacion Mundial de Ex-Presos a Politico de Cubanos, which had been using a variable frequency in the vicinity of 7080. When logged by this writer the station put in a very nice signal, but it was not that far away. According to the FCC, the site was in the Drew Park section of Tampa, near the Tampa International Airport and within an industrial complex. Krueger believes this one might possibly come back in a legal form as some other anti-Castro programs have via a WWCR, WHRI, or WRNO relay.

Among those groups whose programs are currently being relayed is one we always thought would eventually take to the airwaves. This is Brigade 2506, which played a major role in the ill-fated Bay of Pigs invasion of Cuba during the Kennedy administration. Brigade 2506 buys time from Radio Miami International, which currently is itself relayed by WRNO on 7355. Several other anti-Castro organizations are presently doing the same thing. Times could change, but look for the Brigade 2506 program around 0200.

According to Krueger, both Brigade 2506 and another Radio Miami International customer, Alpha 66, continue to train forces in the Florida Everglades. The anti-Castro organizations are very serious about what they are doing. The number who are now broadcasting directly, or more often via relays, is solid evidence of their growing optimism that the Castro regime's days are numbered. They note what has happened in the Soviet Union and now think in terms of not "if" but "when" Castro is gone.

Several of our regular readers have had success logging one of the oldest and most widely heard of all anti-Castro clandestines. This is La Voz del CID. In Pennsylvania Leslie Edwards heard it on 9942 at 0200 and 0300. Connecticut's Bob Thomas logged CID on the same frequency at 0445 UTC. If you have never heard a clandestine, this is a good place to start. All programs are in Spanish, but you can listen for names and get some idea of what the program is about.

CID has bought time on other stations, but it does have its own transmitters (but not currently on American soil), including the one used for the 9942 broadcasts. The station is also an excellent verifier. You can send your report to Cuba Independiente y Democrática, 10020 SW 37th Terrace, Miami, FL 33165. Reports written in English are acceptable.

VERIFYING YOUR RECEPTION REPORT of Kranker Radio International

Date: October 27, 1991
Time: 1338 UTC
Frequency: 15.054.5 MHz

Date this verification completed: 11/15/91

Thanks for checking in!

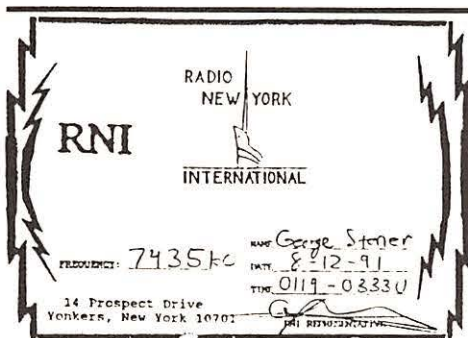
Announced



Kranker Radio International

A NEW SOUND FOR A NEW ERA

Bud Stacey claimed a Kranker Radio International QSL for his collection.



George Stoner QSLed the classic Radio New York International.

Hungary: A recent report in the *New York Times* states that a clandestine (or perhaps pirate) radio station is broadcasting three times a week to the area around Budapest, the Hungarian capital. Even though the country's Communist government is now gone, Tilos (Forbidden) Radio warns about the dangers to freedom of the press and other media which they feel still exist in Hungary. Apparently the police have pursued the station only half-heartedly. Meanwhile the station has won an award from one press group for its civic courage. Thanks to Ricardo Molinar and Herb Gesell for this story.

Nature's Revenge: A wicked storm hit the Ross Revenge, home of Radio Caroline, and the ship broke her anchor chain. She drifted for several hours until becoming grounded on the Goodwin Sands off the coast of England. There she began to list some 30 to 45 degrees. The crew was evacuated by an RAF helicopter and signed over the salvage rights to the ship. She was recovered several days later and towed to the port of Dover. No laws were violated, as Caroline has not been broadcasting from the ship for over a year.

Personally I think this is the end of the commercial shipbased Europirates. They have been made obsolete by new laws—both more liberal and more restrictive—satellites, and the success of Ireland's commercial longwave station. Caroline will survive, however, in some form. Radio New York International has relayed some programs for the organization. She will also be broadcasting over the Intelsat Satellite, via the facilities of the Norwegian-based Radio Northsea International, which is itself named after another former offshore station.

Thanks to England's Martin Lester along with Gregg Allinson and Bob Thomas for the Caroline report. Those who know European radio know that the spirit of Caroline will never die, no matter what.

Martin also notes that Radio Harmony, formerly on 6305, appears to have closed. However, Radio Fax is now on 3910 as well as 6205 and 12255. Both are Irish-based and have been widely heard in North America as well as Europe.

Our Irritation Award goes to the VOA. Why? For their occupancy of 7405 kHz and the QRM it creates on the "pirate frequency," 7415. Of course we understand from a VOA employee that the reason they occupied the frequency was that if they did not, somebody else intended to do so. What we don't understand is why more pirates don't move to more friendly territory.

Despite frustrations here, a number of readers continue to have solid success logging pirates. Alabama's Bud Stacey found an oddity on 13878.1 kHz at 2005 UTC. For several hours he monitored a pirate relay of a legal station in Orlando, Florida on 740 kHz. The relaying pirate never did give an ID. Bud has also had some real progress in the QSL department. Some stations still are making it through on 7415. Up in New Hampshire Bill Battles found his first pirate there. It was **Radio Free New England** at 2131 UTC with Dr. Lobotomy. Bill said it took several years of trying to get this first one. That is sometimes the case, but if you keep at it, eventually you will hear one. So don't give up.

In Virginia Pat Murphy came across **Kranker Radio International** on 15048 at 2033. CIDA Radio turned up on 6250 at 2343.

Kevin Carey in New York said for two years he had no luck chasing pirates, but when it finally started to rain it began to pour. He found four! **WYMN** showed up on 15052 at 1355. **Free Radio** and **Radio USA** were on 7415, and for good measure he heard one of the taped **Voice of Laryngitis** shows on 15050.

Two of our regular California reporters, Skip Harwood and Norm Alexander, have recent logs of **KMCR Magic Carpet Radio** on 7415. Norm's was at 0212, and Skip's at 0300.

Connecticut's Bob Thomas seems to hear just about everything, both licensed and unlicensed. The VOA has cut into his pirate production lately, but he did find **Radio USA** on 7416.9 at 2325.

And finally, several readers have been rewarded with QSLs. Ohio's Joe Leach received one from **Radio Garbanzo** for a 7415 transmission. George Stoner got verifications from **WKND** and the now completely legal (and still highly enjoyable!) **Radio New York International**.

The Last Word: We'll give it to the BBC Monitoring Service. Based on what it reports, although a sort of peace has come to Cambodia (Kampuchea), it does not look like the veteran antiCommunist clandestine Voice of the Khmer is going to go away anytime soon. According to the BBC, it recently celebrated the sixth anniversary of its shortwave transmissions.

This one often makes it all the way to the Atlantic Coast of North America and is a regular on the Pacific Coast. Look for it on 6325 from about 0900 to 1400.



8015CAN

COMPUTER-CONTROL for ICOM

For the R71A....

NEW! Our 801HF listening control program is designed especially for the needs of the serious HF listener. It provides scanning but is also oriented toward scheduled events. Full-featured program includes Scan, Search, Auto-Search, Scheduled Scan, Channel/Bank organization, Terminal-Unit Window, and Notepad Database. 801HF is not just another scanning program!

For the R7000/R9000....

Transform your R7000/R9000 into the Ultimate Scanning Receiver! Add flexible control to match the R7000/R9000's superior receiving capabilities. Includes Scan, Search, Auto-Search, Fast Bank Switching, Activity % Logging and new Event Logging for detailed activity reports. The 801A Scanning System finishes what ICOM started!

Both programs let you scan/search forward or backward, quickly select from multiple scan-continue options and timers, read/set memories from your data, import channel data from any text file! They run on almost any DOS PC with 640K of memory.

801-SCAN is now part of Terzon Systems Inc. We have a voice mail order-info system at (214) 234-8222, mailbox 801.

Programs with interface and cable start at \$144.95. Program only (use your interface) from \$94.95. Demo disk \$5 (specify receiver). Check, M.O., MC/VISA. Texas residents add 8% tax.



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Richardson, TX 75083



THE BEST OF HAWAIIAN MW BCB DX

We have compiled a 60 minute cassette tape of AM (MW) Broadcast Band DX as heard on the islands of Kauai, Oahu, and especially the Big Island of Hawaii, between 1986 and 1991. The recordings were made by a DXer using long-wire and "Beverage" antennas with various communication receivers at several remote locations on each Hawaiian Island. Saudi Arabia, India, the Pacific Islands (such as Samoa, Fiji, Tahiti), Japan, Alaska, lots of North Americans (including Midwestern and Eastern stations), Australia, New Zealand, and so forth make fascinating examples of what MW DX is like in our 50th State. You are likely to be inspired to bring your receiver and a roll of wire with you on your next vacation! Comes with insert.

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\$11. ppd P.O. BOX 535
(CA RES. ADD TAX) **DESCANSO, CA 91916**

INPUT and FEEDBACK

When it comes from our readers, it's our favorite terminology. Send us your QSLs, pics of your monitoring post, your letters to the editor; let the columnists know your tips, experiences, and opinions! **MT** will be all the better for it.

MT Monitoring Team*P.O. Box 98, Brasstown, NC 28902-0098***Greg Jordan**
Frequency Manager**B.W. Battin***New Mexico***Dave Datko***California***Jack Hubby***California***Tammy Wells***Maine***Jacques d'Avignon**
Propagation Forecasts

MT is pleased to welcome Jacques d'Avignon to the staff as propagation forecaster. Jacques has a background in weather forecasting, and has reviewed SWL and ham software for the Ontario DX Association.

We extend our heartfelt thanks to Ike Kerschner for producing the propagation charts in the past and keeping them a viable monitoring tool.

The new charts contain added information and three additional target areas. Your feedback is appreciated.

Kannon Shanmugam
Program Manager**John Carson***Oklahoma***Jim Frimmel***Texas***How to Use the Shortwave Guide****1: Convert your time to UTC.**

Eastern and Pacific Times are already converted to Coordinated Universal Time (UTC) at the top of each page. The rule is: convert your local time to 24-hour format; add (during Standard Time) 5,6,7, or 8 hours for Eastern, Central, Mountain, or Pacific Time, respectively.

Note that all dates, as well as times, are in UTC: for example, the BBC's "Ken Bruce Show" (0030 UTC Sunday) will be heard on Saturday evening (7:30 PM Eastern, 4:30 PM Pacific) in North America, not on Sunday.

2: Choose a program or station you want to hear.

Some selected programs appear on the lower half of the page for prime listening hours. If it's news you're interested in, check out the complete "Newline" listing, which begins on the next page.

Occasionally program listings will be followed by "See X 0000." This information indicates that the program is a re-run, and refers to a previous summary of the program's content. The letter stands for a day of the week, as indicated below, and the four digits represent a time in UTC.

S: Sunday	H: Thursday
M: Monday	F: Friday
T: Tuesday	A: Saturday
W: Wednesday	

3: Find the frequencies for the program or station you want to hear.

Look at the page which corresponds to the time you will be listening. Comprehensive frequency information for English broadcasts can be

found at the top half of the page.

The frequency listing uses the same day codes as the program listings; if a broadcast is not daily, those day codes will appear before the station name.

4: Choose the most promising frequencies for the time, location, and conditions.

Of course, every station can't be heard all the time. To help you find the right frequency, we've included information on the target area of each broadcast. Frequencies beamed toward your area will generally be easier to hear than those beamed elsewhere, even though the latter will often still be audible. Every frequency is followed by one of these target codes:

am: The Americas	me: Middle East
na: North America	as: Asia
ca: Central America	au: Australia
sa: South America	pa: Pacific
eu: Europe	va: various
af: Africa	do: domestic broadcast
me: Middle East	om: omnidirectional

Consult the propagation charts. To help you further find the right frequency, we've included propagation charts at the back of this section, which take into account conditions affecting the audibility of shortwave broadcasts. Simply pick out the region in which you live and find the chart for the region in which the station you want to hear is located. The chart indicates the optimum frequencies for a given time in UTC.

newsline

"Newsline" is your guide to news broadcasts on the air. ■ All broadcasts are world news reports unless followed by an asterisk, which means the broadcast is primarily national news. ■ All broadcasts are daily unless otherwise noted by the day codes.

**0000 UTC
(7:00 PM EST, 4:00 PM PST)**

BBC
CBC, Northern Quebec [A]
Christian Science Monitor
Kol Israel
Radio Australia
Radio Beijing
Radio Canada Int'l
Radio Havana Cuba [T-S]
Radio Korea
Radio Luxembourg
Radio Moscow
Radio New Zealand Int'l [M-A]
Radio Prague Int'l
Radio Thailand
Radio Vilnius
SBC Radio 1, Singapore
Spanish Foreign Radio
Voice of America
0005
Radio Pyongyang
0010
Radio Beijing*
0030
BRT, Brussels
Christian Science Monitor (Asia)
[M]
Christian Science Monitor [T-F]
HCJB
Radio Havana Cuba [T-S]
Radio Netherlands [T-S]
Voice of America (Americas,
East Asia) (Special English) [T-S]
Voice of America (East Asia)
(Special English) [M]
0045
Radio Korea (News Service)
0055
WRNO [W, F]

**0100 UTC
(8:00 PM EST, 5:00 PM PST)**

All India Radio
BBC
CBC, Northern Quebec
Christian Science Monitor
Deutsche Welle
FEBC Radio Int'l, Philippines
Kol Israel
Radio Australia
Radio Belize
Radio Canada Int'l [S-M]
Radio Havana Cuba [T-S]
Radio Japan
Radio Kiev
Radio Luxembourg
Radio Moscow
Radio New Zealand Int'l [M-F]
Radio Prague Int'l
Radio Tashkent
Radio Thailand
Radiotelevisione Italiana

RAE, Buenos Aires [T-A]
SBC Radio 1, Singapore
Spanish Foreign Radio
Voice of America
Voice of Indonesia
WWCR [M-A]
0115
Radio Havana Cuba* [T-S]
0130
Christian Science Monitor (Asia)
[M]
Christian Science Monitor [T-F]
Radio Austria Int'l
Radio Havana Cuba [T-S]
Voice of Greece [M-A]
0155
Voice of Indonesia
WRNO [W, A]

**0200 UTC
(9:00 PM EST, 6:00 PM PST)**

BBC
CBC, Northern Quebec [S-M]
Christian Science Monitor
Deutsche Welle
FEBC Radio Int'l, Philippines
Kol Israel
Radio Australia
Radio Budapest
Radio Havana Cuba [T-S]
Radio Luxembourg
Radio Moscow
Radio Romania Int'l
Radio Thailand
SBC Radio 1, Singapore
Swiss Radio Int'l
Voice of America
Voice of Free China
Voice of Myanmar
WWCR [T-A]
0215
Radio Cairo
Radio Nepal
0230
Christian Science Monitor
(Africa, Europe) [M]
Christian Science Monitor [T-F]
HCJB
Radio Havana Cuba [T-S]
Radio Moscow
Radio Pakistan (Special English)
Radio Portugal [T-A]
Radio Tirana, Albania
Radio Yugoslavia
0245
Radio Kiev
Radio Korea (News Service)

**0300 UTC
(10:00 PM EST, 7:00 PM PST)**

BBC
CBC, Northern Quebec [T-S]
Christian Science Monitor
Deutsche Welle
FEBC Radio Int'l, Philippines
Kol Israel
Radio Australia
Radio Belize
Radio Canada Int'l [S-M]
Radio Havana Cuba [T-S]
Radio Japan
Radio Kiev
Radio Luxembourg
Radio Moscow
Radio New Zealand Int'l [M-F]
Radio Prague Int'l
Radio Tashkent
Radio Thailand
Radiotelevisione Italiana

Deutsche Welle
Radio Australia
Radio Bahrain
Radio Beijing
Radio Belize
Radio Havana Cuba [T-S]
Radio Japan
Radio Moscow
Radio New Zealand Int'l [M-F]
Radio Prague Int'l
Radio Thailand
SBC Radio 1, Singapore
Voice of America
Voice of Free China
WWCR [T-S]
0309
BBC*
0310
Radio Beijing*
0315
Radio Cairo
Radio Havana Cuba* [T-S]
0330
BBC (Africa)*
Christian Science Monitor
(Africa, Europe) [M]
Christian Science Monitor [T-F]
Radio Austria Int'l
Radio Bahrain
Radio Havana Cuba [T-S]
Radio Netherlands [T-S]
Radio Tirana, Albania
UAE Radio, Dubai
0340
Voice of Greece [M-A]
0350
Radio Yerevan
Radiotelevisione Italiana
0355
Radio Japan [M-F]

**0400 UTC
(11:00 PM EST, 8:00 PM PST)**

BBC
CBC, Northern Quebec
Christian Science Monitor
Deutsche Welle
FEBC Radio Int'l, Philippines
Kol Israel
Radio Australia
Radio Bahrain
Radio Havana Cuba [T-S]
Radio Netherlands [T-S]
Radio Tirana, Albania
UAE Radio, Dubai
0340
Voice of Greece [M-A]
0350
Radio Yerevan
Radiotelevisione Italiana
0355
Radio Japan [M-F]

**0400 UTC
(11:00 PM EST, 8:00 PM PST)**

BBC
CBC, Northern Quebec
Christian Science Monitor
Deutsche Welle
Radio Australia
Radio Bahrain
Radio Beijing
Radio Canada Int'l
Radio Havana Cuba [T-S]
Radio Moscow
Radio New Zealand Int'l [M-F]
Radio Prague Int'l
Radio Romania Int'l
Radio RSA
Radio Sofia
Radio Tanzania
Radio Thailand
SBC Radio 1, Singapore
Swiss Radio Int'l
Voice of America
Voice of Turkey

WRNO [F]
WWCR [T-A]
0405
Radio Pyongyang
0410
Radio Beijing*
0425
Radiotelevisione Italiana
0430
Christian Science Monitor
(Africa, Europe, NE Asia) [M]
Christian Science Monitor [T-F]
Radio Bahrain
Radio Botswana
Radio Havana Cuba [T-S]
0450
Radio RSA
0455
WYFR (Network) [T-A]

**0500 UTC
(12:00 AM EST, 9:00 PM PST)**

BBC ("Newshour")
CBC, Northern Quebec [T-S]
Christian Science Monitor
Deutsche Welle
HCJB
Kol Israel
Radio Australia
Radio Bahrain
Radio Beijing
Radio Havana Cuba [T-S]
Radio Japan
Radio Lesotho
Radio Moscow
Radio New Zealand Int'l
Radio Thailand
SBC Radio 1, Singapore
Spanish Foreign Radio
Voice of America
WWCR [T-A]
0510
Radio Beijing*
Radio Botswana
0515
Radio Havana Cuba* [T-S]
0530
BBC (Africa)*
Christian Science Monitor
(Africa, Europe, NE Asia) [M]
Christian Science Monitor [T-F]
Radio Austria Int'l
Radio Havana Cuba [T-S]
Radio Moscow (World Service)
Radio Romania Int'l
Radio Thailand
RTM, Malaysia
UAE Radio, Dubai
Voice of Nigeria
0550
Radio For Peace Int'l [T-A]

**0600 UTC
(1:00 AM EST, 10:00 PM PST)**

BBC
CBC, Northern Quebec
Christian Science Monitor
Deutsche Welle
Radio Australia
Radio Bahrain
Radio Havana Cuba [T-S]
Radio Korea
Radio Moscow
SBC Radio 1, Singapore
Voice of America
WWCR [M-A]
0605
Radio Pyongyang
0610
Voice of Malaysia
0615
Radio Canada Int'l [M-F]
Radio Korea (News Service)
0630
BBC (Africa)*
Christian Science Monitor [M-F]
Radio Austria Int'l [T-A]
Radio Havana Cuba [T-S]
Radio Moscow (World Service)
Radio Polonia
RTV Congolaise, Brazzaville [M-F]
Swiss Radio Int'l
Voice of Nigeria
0640
Radio Prague Int'l
0645
Radio Romania Int'l

**0700 UTC
(2:00 AM EST, 11:00 PM PST)**

BBC
Christian Science Monitor
Radio Australia
Radio Havana Cuba [T-S]
Radio Japan
Radio Moscow
Radio New Zealand Int'l [M, F-A]
SBC Radio 1, Singapore
SLBS, Freetown, Sierra Leone
Voice of Free China
Voice of Myanmar
0705
Radio Pyongyang
0715
Radio Havana Cuba* [T-S]
0730
BBC (Africa)* [M-A]
BRT, Brussels
Christian Science Monitor [M-F]
HCJB
Radio Havana Cuba [T-S]
Radio Moscow (World Service)
Radio Netherlands [M-A]
Radio Prague Int'l

newsline

Swiss Radio Int'l

0745

Radio For Peace Int'l [T-A]

0755

Radio Japan [M-F]

0800 UTC**(3:00 AM EST, 12:00 AM PST)**

BBC

Christian Science Monitor

Radio Australia

Radio Bahrain

Radio Korea

Radio Moscow

Radio New Zealand Int'l [M, W-H]

Radio Pakistan

SBC Radio 1, Singapore

SLBS, Freetown, Sierra Leone

Voice of Indonesia

0805

Radio Pyongyang

0810

Voice of Malaysia

0830

Christian Science Monitor [M-F]

Radio Austria Int'l

Radio Moscow (World Service)

Radio Netherlands [M-A]

Swiss Radio Int'l

0840

Voice of Greece [M-A]

0855

Voice of Indonesia

0900 UTC**(4:00 AM EST, 1:00 AM PST)**

BBC

Christian Science Monitor

Deutsche Welle

Radio Australia

Radio Bahrain

Radio Beijing

Radio Finland [M-F]

Radio Japan

Radio Moscow

Radio New Zealand Int'l

SBC Radio 1, Singapore

Voice of Nigeria

0910

Radio Beijing*

0915

Radio Korea (News Service)

0930

Christian Science Monitor [M-F]

Deutsche Welle (Africa)* [M-F]

Radio Afghanistan

Radio Moscow

0950

Radio Finland [M-F]

Radio Tikhoy Okean [S]

0955

Radio Japan [M-F]

1000 UTC**(5:00 AM EST, 2:00 AM PST)**

All India Radio

BBC

BRT, Brussels [M-A]

Christian Science Monitor

HCJB

Radio Australia

Radio Bahrain

Radio Beijing

Radio Moscow

Radio New Zealand Int'l [M]

Radio RSA

Radio Tanzania

SBC Radio 1, Singapore

Swiss Radio Int'l

Voice of America

1010

Radio Beijing*

1030

Christian Science Monitor [M-F]

Radio Korea

Radio Moscow

Radio Netherlands [M-A]

RTM, Malaysia

UAE Radio, Dubai

Voice of Nigeria

1040

Voice of Greece [M-A]

1055

All India Radio

1100 UTC**(6:00 AM EST, 3:00 AM PST)**

BBC

Christian Science Monitor

Deutsche Welle

Kol Israel

Radio Australia

Radio Bahrain

Radio Beijing

Radio Japan

Radio Korea

Radio Moscow

Radio New Zealand Int'l [T-W]

Radio Pakistan

Radio RSA

SBC Radio 1, Singapore

Swiss Radio Int'l

TWR, Bonaire [M-F]

Voice of America

1105

Radio Pakistan (Special English)

Radio Pyongyang

1109

BBC*

1110

Radio Beijing*

Radio Belize [T-A]

Radio Botswana [M-F]

1115

Radio Korea (News Service)

Radio Nepal

1125

Radio Belize [M]

Radio Botswana [A-S]

1130

Christian Science Monitor [M-F]

Deutsche Welle* [M-F]

Radio Austria Int'l [M-F]

Radio Lesotho

Radio Moscow

Radio Netherlands [M-A]

RTM, Malaysia*

1135

Radio Thailand

1150

Radio RSA

1155

Radio Japan [M-F]

1200 UTC**(7:00 AM EST, 4:00 AM PST)**

BBC

CBC, Northern Quebec [A-S]

Christian Science Monitor

Radio Australia

Radio Bahrain

Radio Bras, Brasilia [M-A]

Radio Jordan

Radio Moscow

Radio New Zealand Int'l

Radio Polonia

Radio Romania Int'l

Radio Tashkent

Radio Thailand

RTM, Malaysia

SBC Radio 1, Singapore

Voice of America

1210

Radio Beijing*

1215

Radio Korea

1230

BRT, Brussels [S]

Christian Science Monitor [M-F]

Radio Cairo

Radio France Int'l

Radio Jordan

Radio Korea

Radio Moscow

Radio Yugoslavia

TWR, Bonaire [A]

1235

Voice of Greece

1300 UTC**(8:00 AM EST, 5:00 AM PST)**

BBC ("Newshour")

CBC, Northern Quebec [A-S]

Christian Science Monitor

Radio Australia

Radio Bahrain

Radio Beijing

Radio Belize

Radio Canada Int'l [M-F]

Radio Moscow

Radio Romania Int'l

Radio Tanzania [A-S]

SBC Radio 1, Singapore

Swiss Radio Int'l

TWR, Bonaire [S-F]

Voice of America

1305

Radio Pyongyang

1310

Radio Beijing*

1325

HCJB [M-F]

1328

Radio Cairo

1330

All India Radio

Christian Science Monitor [M-F]

FEBC Radio Int'l, Philippines

Radio Austria Int'l [M-F]

Radio Canada Int'l

Radio Korea (News Service)

Radio Moscow

Radio Tashkent

RTM, Malaysia

Swiss Radio Int'l

UAE Radio, Dubai

Voice of America (Special

English)

Voice of Turkey

1346

All India Radio (UN News) [A]

1350

Radio For Peace Int'l [T-A]

1355

WYFR (Network) [M-F]

1400 UTC**(9:00 AM EST, 6:00 AM PST)**

BBC

BRT, Brussels [M-A]

CBC, Northern Quebec

Christian Science Monitor

Radio Australia

Radio Bahrain

Radio Beijing

Radio Belize [M-F]

Radio Canada Int'l [S]

Radio France Int'l

Radio Japan

Radio Jordan

Radio Korea

Radio Moscow

RTM, Malaysia*

SBC Radio 1, Singapore

Voice of America

WWCR [M-F]

1410

Radio Beijing*

1415

Radio Nepal

1425

HCJB [M-F]

1430

Christian Science Monitor [M-F]

FEBC Radio Int'l, Philippines

Kol Israel

Radio Moscow

Radio Netherlands [M-A]

Radio Polonia

1445

BBC (East Asia) (Special

English) [M-F]

Voice of Myanmar

1455

All India Radio

Radio Finland [M-F]

1500 UTC**(10:00 AM EST, 7:00 AM PST)**

BBC

CBC, Northern Quebec [A-S]

Christian Science Monitor

Deutsche Welle

Radio Australia

Radio Bahrain

Radio Beijing

Radio Belize [M-A]

Radio Canada Int'l

Radio Japan

Radio Moscow

Radio Romania Int'l

Radio RSA

RTM, Malaysia

SBC Radio 1, Singapore

Voice of America

WWCR [M-F]

1505

Radio Finland

Radio Pyongyang

1510

Radio Beijing*

1530

Christian Science Monitor [M-F]

Deutsche Welle* [M-F]

FEBA, Seychelles

FEBC Radio Int'l, Philippines

Radio Austria Int'l [M-F]

Radio Moscow

Radio Tirana, Albania

Swiss Radio Int'l

Voice of Greece [M-A]

Voice of Nigeria

1545

Radio For Peace Int'l [T-A]

Radio Korea (News Service)

1600 UTC**(11:00 AM EST, 8:00 AM PST)**

BBC

CBC, Northern Quebec [A-S]

Christian Science Monitor

Deutsche Welle

Radio Australia

Radio Bahrain

Radio Beijing

Radio Canada Int'l

Radio France Int'l

Radio Jordan

Radio Korea

Radio Lesotho

Radio Moscow

Radio Pakistan

Radio Polonia

Radio Portugal [M-F]

Radio RSA

Radio Tanzania

SBC Radio 1, Singapore

Voice of America

WWCR [M-F]

Yemen Radio

1609

BBC*

1610

Radio Beijing*

Radio Botswana [M-F]

1615

Radio Pakistan (Special English)

1630

Christian Science Monitor [M-F]

Radio Canada Int'l

Radio Moscow

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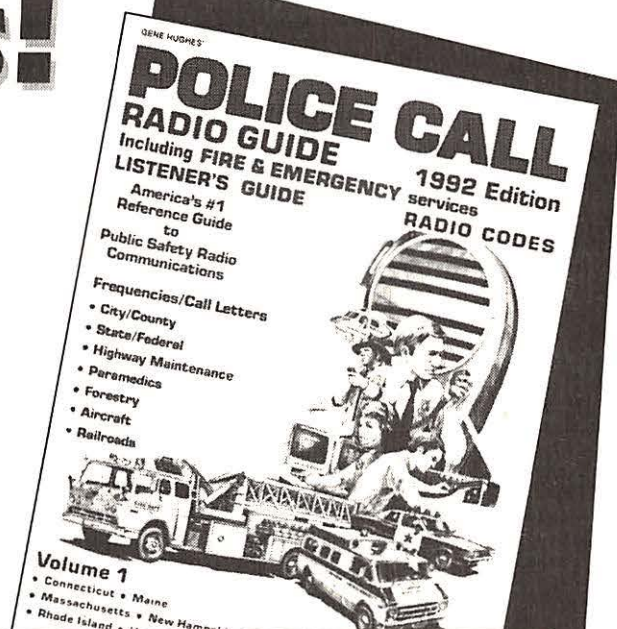
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-- Edward J. Arnold, Bluff City, TN



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newsline

Radio Netherlands [M-A]
Radio Polonia
UAE Radio, Dubai
Voice of America (except Africa)
(Special English)

1700 UTC
(12:00 PM EST, 9:00 AM PST)

BBC
CBC, Northern Quebec [A]
Christian Science Monitor
Radio Australia
Radio Bahrain
Radio Beijing
Radio Belize [M-F]
Radio Canada Int'l
Radio Japan
Radio Jordan
Radio Moscow
Radio RSA
Voice of America
WWCR [M-F]
1705
Radio Pyongyang
1709
BBC (Africa)* [A-S]
1710
Radio Beijing*
1715
Radio Korea (News Service)
1725
Radio Surinam Int'l [M-F]
1730
Christian Science Monitor [M-F]
Radio Moscow
Radio Romania Int'l
WYFR (Network) [A]
1735
WYFR (Network) [M-F]
1740
BBC (Africa)* [M-F]
1750
Radio RSA

1800 UTC
(1:00 PM EST, 10:00 AM PST)

All India Radio
BBC
CBC, Northern Quebec [A]
Christian Science Monitor
Kol Israel
KVOH
Radio Afghanistan
Radio Australia
Radio Bahrain
Radio Belize [M-F]
Radio Bras, Brasilia [M-A]
Radio Canada Int'l
Radio Korea
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Prague Int'l
Radio Tanzania
RAE, Buenos Aires [M-F]
Voice of America
WWCR [A]
1803
Radio Cote d' Ivoire, Abidjan [M-A]
1815
Radio Cote d' Ivoire, Abidjan [M-A]
1825
WYFR (Network) [A]
1830
Christian Science Monitor [M-F]
Radio Austria Int'l
Radio Belize
Radio Moscow
Radio Netherlands [M-A]
Radio Polonia
Radio Sofia
Radio Tirana, Albania
Swiss Radio Int'l
Voice of America (Special English)

1840
SLBC, Sri Lanka
Voice of Greece
1855
BBC (Africa)* [M-F]

1900 UTC
(2:00 PM EST, 11:00 AM PST)

All India Radio
BBC
BRT, Brussels
CBC, Northern Quebec [M-F]
Christian Science Monitor [M-A]
Deutsche Welle
HCJB
KVOH
Radio Australia
Radio Beijing
Radio Canada Int'l [M-F]
Radio Havana Cuba [M-A]
Radio Japan
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Tanzania
SLBS, Freetown, Sierra Leone
Spanish Foreign Radio
Voice of America
WWCR
1910
Radio Beijing*
Radio Botswana
1920
Voice of Greece
1930
Christian Science Monitor [M-F]
Deutsche Welle* [M-F]
Radio Havana Cuba [M-A]
Radio Moscow
Radio Prague Int'l
Radio Romania Int'l
Radio Yugoslavia
Voice of Nigeria
1935
Radiotelevisione Italiana
1945
Radio Korea (News Service)
1955
Radio Finland
WYFR (Network) [M-A]

2000 UTC
(3:00 PM EST, 12:00 PM PST)

BBC
Christian Science Monitor
Kol Israel
KVOH
Radio Australia
Radio Bahrain
Radio Beijing
Radio Belize [M-F]
Radio Canada Int'l
Radio Havana Cuba [M-A]
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Polonia
SLBS, Freetown, Sierra Leone
Swiss Radio Int'l
Voice of America

Voice of Indonesia
Voice of Nigeria
2005
Radio Pyongyang
2010
Radio Beijing*
2025
Radio Havana Cuba* [M-A]
Radiotelevisione Italiana
2030
Christian Science Monitor [M-F]
Radio Havana Cuba [M-A]
Radio Korea
Radio Moscow
Radio Netherlands [M-A]
2045
Radio Korea (News Service)
Radio Sofia
2055
Voice of Indonesia

2100 UTC
(4:00 PM EST, 1:00 PM PST)

All India Radio
BBC ("Newshour")
CBC, Northern Quebec [S-F]
Christian Science Monitor [M-A]
Deutsche Welle
KVOH
Radio Australia
Radio Bahrain
Radio Beijing
Radio Belize [M-F]
Radio Budapest
Radio Japan
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Portugal [M-F]
Radio Prague Int'l
Radio Romania Int'l
SLBS, Freetown, Sierra Leone
Spanish Foreign Radio
Swiss Radio Int'l
Voice of America
Voice of Turkey
2110
Radio Beijing*
2125
WYFR (Network) [M-F]
2130
Christian Science Monitor [M-F]
Radio Austria Int'l
Radio Cairo
Radio Canada Int'l
Radio Moscow
WYFR (Network) [A]
2150
Radio For Peace Int'l [M-F]

2200 UTC
(5:00 PM EST, 2:00 PM PST)

All India Radio
BBC
BRT, Brussels
CBC, Northern Quebec [S-F]
Christian Science Monitor
Radio Australia
Radio Beijing
Radio Canada Int'l

Radio Havana Cuba [M-A]
Radio Kiev
Radio Moscow
Radio New Zealand Int'l
Radio Polonia
Radio Portugal [M-F]
Radio Prague Int'l
Radio Yugoslavia
Radiotelevisione Italiana
SBC Radio 1, Singapore
SLBS, Freetown, Sierra Leone
Voice of America
Voice of Free China
WWCR [M-F]
2208
Voice of America (Caribbean)*
[M-F]
2210
Radio Beijing*
2225
Radio Havana Cuba* [M-A]
2230
Christian Science Monitor [M-F]
Kol Israel
Radio Havana Cuba [M-A]
Radio Moscow
Radio Tirana, Albania
Radio Vilnius
Swiss Radio Int'l
Voice of America (Special English)
WYFR (Network) [M-F]
2245
Radio Sofia
Voice of Greece
2255
WYFR (Network) [M-A]

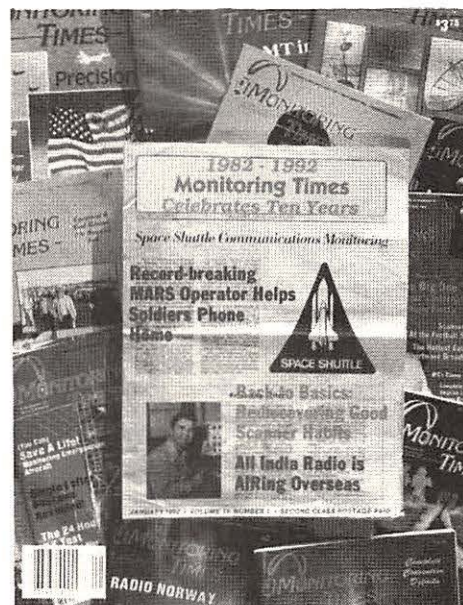
2300 UTC
(6:00 PM EST, 3:00 PM PST)

BBC
CBC, Northern Quebec [M-F]
Christian Science Monitor [M-A]
Radio Australia
Radio Belize [M-F]
Radio Canada Int'l
Radio Japan
Radio Moscow
Radio New Zealand Int'l
RTM, Malaysia
SBC Radio 1, Singapore
Voice of America
Voice of Turkey
WWCR [M-F]
2305
Radio Pyongyang
2315
All India Radio
2320
Radio Thailand
2330
Christian Science Monitor [M-F]
Radio Moscow
Radio New Zealand Int'l [A-H]
RTM, Malaysia*
2345
Radio For Peace Int'l [M-F]
2355
Radio Japan [M-F]

ARE YOU A QSLer?

Gerry Dexter is compiling a new edition of "Secrets of Successful QSL'ing," and invites you to participate. Send your special techniques (including how many attempts, things which were tried but didn't work, etc.), odd replies and experiences with the mail, reporting formats, etc. Write Gerry Dexter at RR 4, Box 110-MT, Lake Geneva, WI 53147; if your idea is used, he'll send you a complimentary copy of the new book.

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0000 UTC

[7:00 PM EST/4:00 PM PST]

FREQUENCIES

0000-0100	ABC Brisbane	4920do	9660do		
0000-0100	ABC Perth	9610do			
0000-0100	All India Radio, Delhi	9535as	9910as	11715as	11745as
		15110as			
0000-0100	AWR Costa Rica	9725ca	11870ca		
0000-0030	BBC London	5965as	5975na	6005sa	6175na
		6195as	7145as	7325na	9580as
		9590na	9915na	11750sa	11945as
		11955as	12095na	15070na	15260sa
		15360pa	17830as		
0000-0100	CFCX Montreal	6005do			
0000-0100	CFRX Toronto	6070do			
0000-0100 smtwhf	Croatian Radio, Zagreb	7315na	9495na		
0000-0100	CSM World Svc, Boston	7395na	9850na	13760na	17555na
0000-0100	FEBC Manila	15450as			
0000-0030	Kol Israel, Jerusalem	7465am	9435am	11605am	
0000-0100	KTBN Salt Lake City	15590am			
0000-0100	KVOH Los Angeles	17775am			
0000-0100	R. for Peace Int'l	7375na			
0000-0100	Radio Australia	11880va	11930va	13605va	15160va
		15240va	15320va	15365va	17630va
		17750va	17795va	21740va	
0000-0100	Radio Baghdad, Iraq	11830am			
0000-0100	Radio Beijing	9770am	11715am		
0000-0100	Radio Havana Cuba	5965am	6180am		
0000-0100	Radio Korea	15575na			
0000-0100	Radio Moscow World Svc	6000am	6045am	7110as	7115am
		7135as	7150am	7255au	7295au
		7330as	7390as	9625am	9715am
		9725am	9790as	9810as	9870as
		12045as	12050am	12055as	15130as
		15350am	15420as	15425as	17610as
		17655au	17665am	17700am	17720am
		17775as	17890am	21480am	21690as
		21790au			
0000-0100 smtwhf	Radio New Zealand Int'l	17770pa			

0000-0030 sm	Radio Norway	9645am	11925am		
0000-0030 stwhf	Radio Prague	7345na	11685na	11990na	
0000-0050	Radio Pyongyang	11335na	13760na	15115na	
0000-0100	Radio Sofia, Bulgaria	9595am	9700am	11660eu	11680na
		11720eu	11950na		
0000-0100	Radio Thailand	4830as	9655as	11905as	
0000-0030	Radio Vilnius, Lithuania	7400na	9710na	15180na	17605na
		17690na			
0000-0100 sm	RCI Montreal	5960am	9755am		
0000-0100 twhfa	RCI Montreal	5960am	9755am		
0000-0100	RTM Malaysia	7295do			
0000-0100	SBC Radio 1, Singapore	5010do	5052do	11940do	
0000-0100	SLBS, Sierra Leone	3316do			
0000-0100	Spanish Foreign Radio	9530na			
0000-0030	VOA	5995sa	7405sa	9775sa	11580sa
		15120sa	15205sa		
0000-0100	VOA	6130ca	9455ca	11695ca	
0000-0100	VOA	7120as	9770as	11760as	15185as
		15290as	17735as	17820as	
0000-0100	WHRI Noblesville	7315am	9495am		
0000-0100	WINB Red Lion, Penn.	15145eu			
0000-0100	WRNO New Orleans	7355am			
0000-0100	WWCR Nashville	7435na			
0000-0100	WYFR	5985am			
0030-0100	BBC London	5965as	5975na	6005sa	6175na
		7135as	7325na	9580as	9590na
		9915na	11750sa	11955as	12095na
		15260sa	15360pa		
0030-0100	BRT Brussels	13655na	13710na		
0030-0100	HCJB Quito Ecuador	9745am	15155am	21455am	
0030-0100	Radio Netherlands	6020am	6165am	11835am	
0030-0100	Sri Lanka B'casting Corp.	6005as	9720as	15425as	
0030-0100	VOA	5995sa	7405sa	9775sa	11580sa
		15120sa	15205sa		
0030-0100	VOIRI Teheran	9022na	9765na	15260na	
0040-0050 twhf	R Nacional de Venezuela	9540om			
0045-0100	Radio Korea World News	7275as			

SELECTED PROGRAMS

Sundays

- 0030 BBC: The Ken Bruce Show. Ken Bruce plays pop music, past and present.
- 0030 Radio Australia: Book Reading. Serialized readings from popular books.

Mondays

- 0030 BBC: In Praise Of God. Christian religious services and meditations.
- 0030 Radio Australia: Just Out. Rob Hoskin plays recent Australian music releases.

Tuesdays

- 0030 BBC: Panel Game. Iain Johnstone hosts the movie game show "Screenplay" (4th, 11th); Benny Green returns with another series of "Jazz Score" (through April 6th).
- 0030 Radio Australia: Music/Information. See S 0330.

Wednesdays

- 0030 BBC: Omnibus. Topical features on almost any topic, from Dracula to drugs.
- 0030 Radio Australia: Music/Information. See S 0330.

Thursdays

- 0030 BBC: Comedy/Drama. See W 1530.
- 0030 Radio Australia: Music/Information. See S 0330.

Fridays

- 0030 BBC: Music Feature. "Songs Of The Savannah" features music from West Africa (7th, 14th, 21st); on the 200th anniversary of his birth, explore "Rossini And His World" (through April 17th).
- 0030 Radio Australia: Music/Information. See S 0330.

Saturdays

- 0030 BBC: From The Weeklies. A review of the British weekly press.
- 0030 Radio Australia: Word Of Mouth. See M 1445.
- 0045 BBC: Recording Of The Week. See M 0615.



*Radio France
QSL submitted
by Richard Lane,
Dawson, Illinois.*

0100 UTC

[8:00 PM EST/5:00 PM PST]

FREQUENCIES

0100-0200	ABC Brisbane	4920do	9660do					15420am	15425as	15505as	17610am
0100-0200	ABC Perth	9610do						17655as	17665as	17700am	17720as
0100-0115	All India Radio, Delhi	9535as	9910as	11715as	11745as			17775as	17825am	17890am	21480am
		15110as						21690as	21790au		
0100-0200	BBC London	5965as	5975na	6005sa	6175na	0100-0125	Radio Netherlands	6020am	6165am	11835am	
		7135as	7325na	9580as	9590na	0100-0200	Radio New Zealand Int'l	17770pa			
		9915na	11750sa	11955as	12095na	0100-0130 sm	Radio Norway	9605na			
		15260sa	15280as	15360pa	21715as	0100-0130	Radio Prague	5930na	7345na	11685na	
0100-0200	CFCX Montreal	6005do				0100-0130	Radio Sweden	9695as	9795na	11705na	
0100-0200	CFRX Toronto	6070do				0100-0130	Radio Tashkent	5930as	5995as	7190as	7265as
0100-0200	CKZU Vancouver	6160do				0100-0200	Radio Thailand	4830as	9655as	11905as	
0100-0200	Croatian Radio, Zagreb	7315na	9495eu			0100-0120	RAI, Rome	9575am	11800am		
0100-0200	CSM World Svc, Boston	7395na	9850na	13760na	17555na	0100-0130 twhfa	RCI Montreal	9560am	9755am		
0100-0150	Deutsche Welle	6040na	6055na	6085na	6145na	0100-0200 sm	RCI Montreal	9535am	11845am	11940am	13720am
		9515na	9565na	9610na	9640na	0100-0200 smtwh	RTM Malaysia	7295do			
		9770na	11865na			0100-0200	SBC Radio 1, Singapore	5010do	5052do	11940do	
0100-0200	FEBC Manila	15450as				0100-0200	SLBS, Sierra Leone	3316do			
0100-0200	HCJB Quito Ecuador	9745am	15155am	21455am		0100-0200	Spanish Foreign Radio	9530na			
0100-0130	Kol Israel, Jerusalem	7465am	9435am	11605am		0100-0200	Sri Lanka B'casting Corp.	6005as	9720as	15425as	
0100-0200	KTBN Salt Lake City	15590na				0100-0200	VOA	5995am	6130am	7405am	9455am
0100-0130	Nat'l Radio of Laos	7112as						9775as	11580am	15120am	15205am
0100-0200	R. for Peace Int'l	7375na				0100-0200	VOA	7205as	9740as	11705as	15250as
0100-0200	Radio Australia	11880va	11930va	15160va	15240va			17735as	21550as		
		15320va	15365va	17630va	17750va	0100-0200	Voice of Indonesia	7125as	9675as	11752as	11785as
		17795va	21525va	21740va	21775va	0100-0130	VOIRI Teheran	9022na	9765na	15260na	
0100-0200 mwf	Radio Free Croatia (WHRI)	7315na	9495na			0100-0200	WHRI Noblesville	7315am			
0100-0200	Radio Havana Cuba	5965am	6180am			0100-0200	WINB Red Lion, Penn.	15145na			
0100-0200	Radio Japan	11840na	15195am	17810am	17835as	0100-0200	WRNO New Orleans	7355na			
		17845am				0100-0200	WWCR Nashville	7435na	7490na		
0100-0200	Radio Kiev	7400na	9800na	15180na	17605na	0100-0200	WYFR	6065am	9505am	15440am	
		17690na				0130-0200	Fujian PBS, China	4975do	5040do		
0100-0200	Radio Moscow World Svc	6000am	6045am	7110as	7115am	0130-0200 mwf	R. Alma Ata, Khazakhstan	5915do	6135do		
		7135as	7150am	7160au	7255as	0130-0200	Radio Federal Yugoslavia	9555am	11885na		
		7275as	7310am	7390as	9625as	0130-0200	RAI Vienna	9870sa	9875na	13730na	
		9665am	9715as	9725am	9745as	0130-0200	UAE Radio, Dubai	11795na	13695eu	15320eu	15435eu
		9790au	9855am	11985am	12025as	0130-0150 mtwhfa	Voice of Greece	9395na	9420na	11645na	
0100-0200	Radio Moscow World Svc	12045as	12050am	15295am	15350am	0145-0200	Vatican Radio	7125au	9650au		

SELECTED PROGRAMS

Sundays

- 0100 Radio For Peace Int'l: FIRE. Programming produced by women worldwide on women's issues
- 0101 BBC: Play Of The Week. This month's drama: "Different States" (2nd, starts at 0030 UTC); "The Black Prince" (9th, 16th); "Amongst Barbarians" (23rd).
- 0130 Radio Australia: At Your Request. Dick Paterson plays music requests.

Mondays

- 0100 Radio For Peace Int'l: FIRE. See S 0100.
0101 BBC: Feature/Drama. Chats with American politicians
feature in "The Power And The Glory" (3rd); Mike Young
searches after his namesake, "The River Young" (10th);
Led Zeppelin, U2, and other groups headline "Classic
Concerts" (through March 23rd).
0130 Radio Australia: Music/Information. See S 0330.
0145 BBC: Classical Music. "The Mozart Phenomenon" looks at
the artist's amazing success (3rd), followed by another
series of "Mastersingers" (through April 6th).

Tuesdays

- 0100 Radio For Peace Int'l: FIRE. See S 0100.
0105 BBC: Outlook. See M 1405.
0130 BBC: Folk In Britain. Ian Anderson is the host, folk music is the fare.

- 0130 Radio Australia: Music/Information. See S 0330.
0145 BBC: Health Matters. New medical developments and methods of keeping fit.

Wednesdays

- 0100 Radio For Peace Int'l: FIRE. See S 0100.
0105 BBC: Outlook. See M 1405.
0130 BBC: Talks. "It Made Our World" profiles inventions that
have shaped our civilization (through April 1st).
0130 Radio Australia: Music/Information. See S 0330.
0145 BBC: Country Style. David Allan profiles the country
music scene on both sides of the pond.

Thursdays

- 0100 Radio For Peace Int'l: FIRE. See S 0100.
0105 BBC: Outlook. See M 1405.
0130 BBC: Waveguide. See W 0415.
0130 Radio Australia: Music/Information. See S 0330.
0140 BBC: Book Choice. See W 0425.
0145 BBC: The Farming World. Agricultural news and technological innovations for farmers.

Fridays

- 0100 Radio For Peace Int'l: FIRE. See S 0100.

- 0105 BBC: Outlook. See M 1405.
0130 BBC: Seven Seas. Malcolm Billings presents news about ships and the sea.
0130 Radio Australia: Music/Information. See S Q330.
0145 BBC: Global Concerns. An update on environmental issues.

Saturdays

- 0100 Radio For Peace Int'l: FIRE. See S 0100.
0105 BBC: Outlook. See M 1405.
0130 BBC: Short Story (except 1st, 29th: Seeing Stars). See S 0430.
0130 Radio Australia: Music/Information. See S 0330.
0145 BBC: Jazz Now And Then. George Reid presents a weekly mix of new releases, old tracks, and interviews.

With the advent of computers, monitoring has become "Find what I want," not "Look what I found!" So don't forget to look, instead of just "scanning" shortwave.

Todd Dokey
Lodi, California

0200 UTC

[9:00 PM EST/6:00 PM PST]

FREQUENCIES

0200-0300	ABC Brisbane	4920do	9660do			0200-0230 sm	Radio Norway	9605na			
0200-0300	ABC Perth	200	6070do	9610do		0200-0300	Radio Romania Int'l	5990am	6155am	9510am	9570am
0200-0230	BBC London	5975na	6005sa	6175na	6195eu			11830am	11940am		
		7135as	7325na	9410eu	9580as	0200-0230	Radio Sweden	9695na	11705na		
		9590na	9670me	9915na	11750sa	0200-0300 TWHFA	Radio Thailand	4830as	9655as	11905as	
		11955as	12095va	15260sa	15280as	0200-0300 twhfa	RAE Buenos Aires	11710na			
		15360pa	15380as	21715as			RCI Montreal	9535sa	9755sa	11845sa	11940sa
								13720sa			
0200-0300	CKZU Vancouver	6160do				0200-0300 smtwh	RTM Malaysia	7295do			
0200-0300	CSM World Svc, Boston	9455na	9850na	13760eu		0200-0300	SBC Radio 1, Singapore	5010do	5052do	11940do	
0200-0250	Deutsche Welle	6035as	7285as	9615as	9690as	0200-0300	SLBS, Sierra Leone	3316do			
		11945as	12055as			0200-0230	Sri Lanka B'casting Corp.	6005as	9720as	15425as	
						0200-0230	Swiss Radio Int'l	6135am	9650am	9885am	
0200-0230	FEBC Manila	15480as						12035am	17730am		
0200-0300	HCJB Quito	9745na	15155na	17875sa	21455sa	0200-0300	V. of Free China, Taiwan	5950na	9680na	9765pa	11740ca
0200-0230	Kol Israel, Jerusalem	7465am	9435am	11605am				11860as	15345as		
0200-0300 AS	KSDA Guam	13720as				0200-0230	VOA	5995am	7405am	9775am	11580am
0200-0300	KTBN Salt Lake City	7510am						15120am	15205am		
0200-0300	R. for Peace Int'l	7375na				0200-0300	VOA	7205as	9740as	11705as	15250as
0200-0300	Radio Australia	11880va	11930va	15160va	15240va			17735as	21550as		
		15320va	15365va	17630va	17750va	0200-0230 mtwhfa	Voice of Kenya	4935do			
		17795va	21525va	21740va	21775va	0200-0300	WHRI Noblesville	7315na	9495sa		
0200-0300	Radio Budapest	6110na	9835na	11910na		0200-0300	WINB Red Lion, Penn.	15145eu			
0200-0300	Radio Cairo	9475na	9675na			0200-0300	WRNO New Orleans	7355am			
0200-0215	Radio Federal Yugoslavia	9580na	11885na			0200-0300	WWCR Nashville	5935na	7490na		
0200-0300	Radio Havana Cuba	5965am	15140na			0200-0300	WYFR	6085am	9505am	15440am	
0200-0300	Radio Luxembourg	15350om				0200-0300	BBC London	5975na	6005sa	6175na	6195eu
0200-0300	Radio Moscow World Svc	6000am	6045am	7115am	7135as			7135me	7325na	9410eu	9670me
		7150am	7160as	7240au	7255as			9915na	11750sa	11955me	12095va
		7275as	7310am	7390as	9625as	0230-0250	Radio Finland	15260sa	15280as	15360pa	21715as
		9665am	9715as	9725am	9745am	0230-0245	Radio Pakistan	9560na	11755na		
		9765am	9790me	11985am	12045me			9545as	15115as	17640as	17725as
		12050am	15295as	15350am	15420am			21730as			
		15425me	17590me	17610am	17655am	0230-0300	Radio Pilipinas, Manila	17760pa	17840pa	21580pa	
		17665am	17700am	17720me	17775as	0230-0300 twhfa	Radio Portugal	9555sa	9600na	9705na	11840sa
		17825am	17890am	21480am	21690as	0230-0300	Radio Tirana	9760na	11825na		
		21790au				0230-0300	Sri Lanka B'casting Corp.	9720as	15425as		
0200-0300	Radio New Zealand Int'l	17770pa				0230-0300 s	Voice of Kenya	4935do			
						0240-0300	Radio 2, Zambia	6165do	7235do		

SELECTED PROGRAMS

Sundays

- 0200 Radio For Peace Int'l: The Wisdom Of Joseph Campbell. Conversations with the late mythologist and philosopher of PBS fame.
- 0208 Swiss Radio Int'l: Dateline. World news, commentary, and analysis of current affairs.
- 0218 Swiss Radio Int'l: Swiss Shortwave Merry-Go-Round. Bob Thomann and Bob Zanotti present shortwave radio news and advice.
- 0230 BBC: Feature. This month, find out "What Do Hindus Believe?" (2nd, 9th); a sculptor plies his trade in "A Modern Midas" (16th); and learn about some "Fancy Cats" (23rd).
- 0230 Radio Australia: Fine Music Australia. The best in Australian classical music.
- 0230 Radio Finland: Perspectives. Reports on current affairs developments.
- 0230 Radio For Peace Int'l: World Of Radio. Glenn Hauser's communications program for shortwave radio listeners.
- 0240 Radio Finland: Starting Finnish. Finnish language lessons for English speakers.

Mondays

- 0200 Radio For Peace Int'l: Visions For A Better World. A look at organizations and people working to improve our world.
- 0208 Swiss Radio Int'l: Feature. See S 0638.
- 0230 BBC: Composer Of The Month. Profiles of famous composers; this month, Benjamin Britten.
- 0230 Radio Australia: Music/Information. See S 0330.
- 0230 Radio Finland: Business Monday. A look at developments in the world of business and finance.
- 0230 Radio For Peace Int'l: Sound Currents Of The Earth. Jim

- Bean presents new age, world, and electronic music.
- 0240 Radio Finland: Airmail. Answers to listener letters and questions.

Tuesdays

- 0200 Radio For Peace Int'l: Outlaw For Peace. Country music's Willie Nelson comes to shortwave.
- 0208 Swiss Radio Int'l: Dateline. See S 0208.
- 0230 BBC: Quiz. See M 1215.
- 0230 Radio Australia: Music/Information. See S 0330.
- 0230 Radio Finland: Northern Report. The latest news, current affairs, and analysis from around Scandinavia.
- 0230 Radio For Peace Int'l: Steppin' Out Of Babylon. Sue Supriano speaks with individuals who fight for freedom and justice.
- 0240 Radio Finland: Press Review. See M 1240.
- 0245 Radio Finland: Highlights. Media and cultural news from Finland.

Wednesdays

- 0200 Radio For Peace Int'l: Outlaw For Peace. See T 0200.
- 0208 Swiss Radio Int'l: Dateline. See S 0208.
- 0230 BBC: Development '92. Aid and development issues for developing nations.
- 0230 Radio Australia: Book Reading. See S 0030.
- 0230 Radio Finland: Northern Report. See T 0230.
- 0230 Radio For Peace Int'l: Consider The Alternatives. See S 0630.
- 0240 Radio Finland: Press Review. See M 1240.
- 0245 Radio Finland: Sports Fare. A feature on sports and off-hours activities.

Thursdays

- 0200 Radio For Peace Int'l: Outlaw For Peace. See T 0200.
- 0208 Swiss Radio Int'l: Dateline. See S 0208.

- 0230 BBC: Sports International. Live play-by-play, interviews, features, and discussions from the sports world.
- 0230 Radio Australia: Music/Information. See S 0330.
- 0230 Radio Finland: Northern Report. See T 0230.
- 0230 Radio For Peace Int'l: Amnesty Int'l Reports or The Other Americas Radio. See S 0530.
- 0240 Radio Finland: Press Review. See M 1240.
- 0245 Radio Finland: Roots In Finland. For 1992, the "year of homecoming" for expatriate Finns, a look at foreigners of Finnish origin.

Fridays

- 0200 Radio For Peace Int'l: Outlaw For Peace. See T 0200.
- 0208 Swiss Radio Int'l: Dateline. See S 0208.
- 0230 BBC: Drama. See H 1130.
- 0230 Radio Australia: Music/Information. See S 0330.
- 0230 Radio Finland: Northern Report. See T 0230.
- 0230 Radio For Peace Int'l: Living Enrichment Center. See S 1500.
- 0240 Radio Finland: Press Review. See M 1240.
- 0245 Radio Finland: Names In The News. Interviews with Finnish newsmakers.

Saturdays

- 0200 Radio For Peace Int'l: Outlaw For Peace. See T 0200.
- 0208 Swiss Radio Int'l: Dateline. See S 0208.
- 0230 BBC: People And Politics. The background to the British political scene.
- 0230 Radio Australia: This Australia. See S 0430.
- 0230 Radio Finland: Northern Report. See T 0230.
- 0230 Radio For Peace Int'l: New Dimensions Radio. See M 0400.
- 0240 Radio Finland: Press Review. See M 1240.
- 0245 Radio Finland: Finnish History. A look back at historical events affecting Finland.

0300 UTC

[10:00 PM EST/7:00 PM PST]

FREQUENCIES

0300-0400	ABC Brisbane	4920do	9660do					0300-0400	Radio New Zealand Int'l	17775me	17890am	21690as	21790au
0300-0400	ABC Perth	9610do						0300-0330 sm	Radio Norway	17770pa			
0300-0330	BBC London	3255af	5975na	6005af	6180eu			0300-0400	Radio Oranje, South Africa	9645na			
		6190af	6195eu	7135me	9410eu			0300-0400	Radio Oranje, South Africa	3215do			
		9600af	9670me	11760me	11955me			0300-0330	Radio Pilipinas, Manila	3215do			
		12095eu	15280as	15310as	15360pa			0300-0330	Radio Prague	17760pa	17840pa	21580pa	
		15380as	15420af	15590af	21715as			0300-0330	Radio Tanzania	5930na	7345na	11685na	
0300-0330	BBC London	9915na	6175na	7325na	15260sa			0300-0400	Radio Thailand	5985af	9685af	11765af	
		11750sa	6005sa					0300-0400	RTM Malaysia	4830as	9655as	11905as	
0300-0400	BBS Bahrain	6010me						0300-0400 smtwh	SBC Radio 1, Singapore	7295do			
0300-0400	CFCX Montreal	6005do						0300-0400	SLBS, Sierra Leone	5010do	5052do	11940do	
0300-0400	CFRX Toronto	6070do						0300-0400	Sri Lanka B'casting Corp.	3316do			
0300-0400	CKZU Vancouver	6160do						0300-0400	TIFC Costa Rica	9720as	15425as		
0300-0400	CSM World Svc, Boston	9455na	9850na	13760na				0300-0400	TWR Bonaire	5055ca			
0300-0350	Deutsche Welle	6045na	6055na	6085na	6120na			0300-0400	V. of Free China, Taiwan	9535am	11930am		
		9535na	9545na	9640na	9705na			0300-0400	V. of Free China, Taiwan	5950na	9680na		
		9770na						0300-0315	Vatican Radio	6150na	7305na		
0300-0400	HCJB Quito	9745na	15155na	21455na				0300-0330	VOA	5965eu	11905me	15160me	17810eu
0300-0400	KTN Salt Lake City	7510am								17895me			
0300-0400	KVOH Los Angeles	9785na						0300-0400	VOA	6035af	7405af	9575af	11835af
0300-0400	R. for Peace Int'l	7375na	15030na							15115af	17715af	21600af	
0300-0400	Radio Australia	11880va	11930va	15160va	15240va			0300-0400	Voice of Kenya	4935do			
		15320va	15365va	17630va	17750va			0300-0400	WHRI Noblesville	7315na	9495sa		
		17795va	21525va 2	1740va	21775va			0300-0400	WRNO New Orleans	7355am			
0300-0400	Radio Beijing	9770am	9690am	11715am				0300-0400	WWCR Nashville	7435na			
0300-0330	Radio Cairo	9475na	9675na					0300-0400	WYFR	6065am	9505am		
0300-0400	Radio Cultura, Guatemala	3300do						0330-0400	BBC London	3255af	5975na	6005af	6180eu
0300-0400	Radio Havana Cuba	11950am	15140am							6190af	6195eu	9410eu	9600af
0300-0330	Radio Japan	15325am	17825am	21610am						9915na	11740af	11760me	11955me
0300-0400	Radio Japan	5960na	11870na	17810na						12095eu	15280as	15310as	15420af
0300-0345	Radio Kiev	4825eu								17885af	21715as		
0300-0400	Radio Moscow World Svc	6000am	6045am	7115am	7135as			0330-0400	Radio Netherlands	9590na	11720na		
		7150am	7160as	7240am	7255as			0330-0400 twhfa	Radio Portugal	9600sa	9705na	9765na	11765sa
		7275as	7310am	7350as	9625as			0330-0400	Radio Sweden	9695sa	11705sa		
		9665am	9715as	9725am	9765am			0330-0400	Radio Tirana	9760na	11825na		
		9880as	11920au	12010as	12035as			0330-0400	RAI Vienna	9870ca	13730am		
		12045as	12050am	13670am	13745me			0330-0400	UAE Radio, Dubai	11945na	13675na	15400na	15435na
		15295me	15350am	15420am	15425am			0340-0350 twhfes	R National de Venezuela	9540om			
		15470as	17590as	17610am	17655as			0340-0350 mtwhfa	Voice of Greece	9395na	9420na	11645na	
		17665am	17690am	17700am	17720as			0350-0400	Radio Yerevan, Armenia	7400na	9750na	15180na	17605na
										17690na			

SELECTED PROGRAMS

Sundays

- 0300 Radio For Peace Int'l: RFPI's Mailbag. James and Debra Latham present listener letters, comments, questions, and advice.
- 0309 BBC: Words Of Faith. Speakers from various faiths discuss scripture and their beliefs.
- 0313 Radio Australia: Back Page. Brendon Telfer looks at sports in the Asian/Pacific region.
- 0315 BBC: Sports Roundup. News from the world of sports.
- 0330 BBC: From Our Own Correspondent. Reporters comment on the background to the news.
- 0330 Radio Australia: Music/Information. Overnight music, interspersed with news.
- 0330 Radio For Peace Int'l: Radio New York International. A weekly two-hour show produced by the infamous pirate radio station.
- 0350 BBC: Write On... Listener letters, opinions, and questions.

Mondays

- 0300 Radio For Peace Int'l: Sound Currents Of The Earth. See M 0230.
- 0309 BBC: Words Of Faith. See S 0309.
- 0313 Radio Australia: Sports Report. See S 1313.
- 0315 BBC: Sports Roundup. See S 0315.
- 0330 BBC: Anything Goes. See S 1430.
- 0330 Radio Australia: Music/Information. See S 0330.
- 0330 Radio For Peace Int'l: Food For The Thoughtful. Current dietary trends and how they affect our health.

Tuesdays

- 0300 Radio For Peace Int'l: The CFRU Series. See M 0500.
- 0309 BBC: Words Of Faith. See S 0309.
- 0313 Radio Australia: Sports Report. See S 1313.
- 0315 BBC: Sports Roundup. See S 0315.
- 0330 BBC: John Peel. Newly released albums and singles from the contemporary music scene.
- 0330 Radio Australia: Music/Information. See S 0330.
- 0330 Radio For Peace Int'l: UNESCO. A selection of programs presenting the cultural heritage of many nations.
- 0345 Radio For Peace Int'l: Undercurrents. See S 1545.

Wednesdays

- 0300 Radio For Peace Int'l: Visions For A Better World. See M 0200.
- 0309 BBC: Words Of Faith. See S 0309.
- 0313 Radio Australia: Sports Report. See S 1313.
- 0315 BBC: Sports Roundup. See S 0315.
- 0330 BBC: Discovery. An in-depth look at scientific research.
- 0330 Radio Australia: Music/Information. See S 0330.
- 0330 Radio For Peace Int'l: United Nations. See M 2330.
- 0345 Radio For Peace Int'l: Undercurrents. See S 1545.

Thursdays

- 0300 Radio For Peace Int'l: Changemakers. See S 2300.
- 0309 BBC: Words Of Faith. See S 0309.
- 0313 Radio Australia: Sports Report. See S 1313.
- 0315 BBC: Sports Roundup. See S 0315.
- 0330 BBC: Assignment. A weekly examination of topical issues, from Batman to the Amazon.

- 0330 Radio Australia: Music/Information. See S 0330.

- 0330 Radio For Peace Int'l: UNESCO. See T 0330.

- 0345 Radio For Peace Int'l: Undercurrents. See S 1545.

Fridays

- 0300 Radio For Peace Int'l: Feature. "Red Cross Roads," "Mesoamerica," or programming from Radio Netherlands.
- 0309 BBC: Words Of Faith. See S 0309.
- 0313 Radio Australia: Sports Report. See S 1313.
- 0315 BBC: Sports Roundup. See S 0315.
- 0330 BBC: Focus On Faith. Comment and discussion on major issues in various religions.

- 0330 Radio Australia: Music/Information. See S 0330.

- 0330 Radio For Peace Int'l: UNESCO. See T 0330.

- 0345 Radio For Peace Int'l: Undercurrents. See S 1545.

Saturdays

- 0300 Radio For Peace Int'l: New Dimensions Radio. See M 0400.
- 0309 BBC: Words Of Faith. See S 0309.
- 0313 Radio Australia: Music/Information. See S 0330.
- 0315 BBC: Sports Roundup. See S 0315.
- 0330 BBC: The Vintage Chart Show. Paul Burnett with past Top 20 pop music hits.
- 0330 Radio Australia: Women In Politics. Interviews with women politicians.
- 0330 Radio For Peace Int'l: United Nations. See M 2330.
- 0345 Radio For Peace Int'l: Undercurrents. See S 1545.

0400 UTC

[11:00 PM EST/8:00 PM PST]

FREQUENCIES

0400-0500	ABC Brisbane	4920do	9660do				0400-0425	Radio Netherlands	9590am	11720am		
0400-0500	ABC Perth	9610do					0400-0500 smtwhf	Radio New Zealand Int'l	17770pa			
0400-0430	BBC London	3255af	3955eu	5975na	6180eu		0400-0430	Radio Prague	5930na	7345na	11685na	
		6190af	6195eu	7105af	7230eu		0400-0450	Radio Pyongyang	15180as	15230as	17765as	
		9410eu	9600af	9610af	9915na		0400-0430	Radio Romania Int'l	5990am	6155am	9510am	9570am
		11760me	15070va	15280as	15310as				11830am	11940am		
0400-0430	BBC London	15420af	15590eu	17885af	21715as		0400-0500	Radio RSA, Johannesburg	7270af	11900af	15230af	
		6005af	6175am	11750va	11955me		0400-0500	Radio Sofia, Bulgaria	11720eu	11765eu		
		12095va					0400-0430	Radio Tanzania	5985af	9685af	11765af	
0400-0500	BBS Bahrain	6010me					0400-0430	Radio Thailand	4830as	9655as	11905as	
0400-0500	CFCX Montreal	6005do					0400-0430	RCI Montreal	6150eu	9505eu	9670me	11925me
0400-0500	CFRX Toronto	6070do					0400-0500 smtwh	RTM Malaysia	7295do			
0400-0500	CKZU Vancouver	6160do					0400-0500	SBC Radio 1, Singapore	5010do	5052do	11940do	
0400-0500	Croatian Radio, Zagreb	7315na	9495eu				0400-0500	SLBS, Sierra Leone	3316do			
0400-0500	CSM World Svc, Boston	9400na	9840af	13760na	17780as		0400-0430	Sri Lanka B'casting Corp.	9720as	15425as		
0400-0450	Deutsche Welle	6065af	6130af	7150af	7225af		0400-0430	Swiss Radio Int'l	6135am	9885am	12035am	13635me
		7275af	9565af	9665af	9765af		0400-0430	VOA	5995eu	6040me	6140me	7170eu
		11765af	13770af						7200eu	9715eu		
0400-0430	HCJB Quito	9745na	15155na	21455sa			0400-0430	VOA	6035af	7405af	9575af	11780af
0400-0500	KTBN Salt Lake City	7510am							11835af	15115af	17715af	21600af
0400-0500	KVOH Los Angeles	9785am					0400-0500	Voice of Kenya	4935do			
0400-0500	R. for Peace Int'l	7375na	15030na				0400-0500	WHRI Noblesville	7315na	9495sa		
0400-0500	Radio 2, Zambia	6165do	7235do				0400-0500 smtwhf	WMLK Bethel	9465eu			
0400-0500	Radio Australia	11880va	11930va	15160va	15170va		0400-0500	WRNO New Orleans	7355am			
		15240va	15320pa	15365va	17630va		0400-0500	WWCR Nashville	7435na			
		17795va	21525va	21740va	21775va		0400-0500	WYFR	6065am	9505am		
0400-0500	Radio Beijing	11695am					0425-0440	RAI, Rome	5990me	7275me		
0400-0425	Radio Cultura, Guatemala	3300do					0430-0500	BBC London	3255af	3955eu	5975na	6005af
0400-0500	Radio Cultura, Guatemala	3300do							6180eu	6190af	6195eu	7230eu
0400-0500 mwf	Radio Free Croatia (WHRI)	7315na	9495na						9410eu	9600af	11760me	12095va
0400-0450	Radio Havana Cuba	5965am	6180am	9750am	11760am				15070va	15280as	15310as	15400af
		15140am							15420af	15590eu	21470af	21715as
0400-0500	Radio Moscow World Svc	6000am	6045am	7135as	7150am		0430-0500	Georgian Radio, Tbilisi	11850me			
		7160as	7240me	7270me	7310am		0430-0500 mtwhf	NBC Windhoek, Namibia	3270af	3290af		
		7350as	9450as	9625as	9715as		0430-0500	Radio Nigeria	3326do	4770do		
		9725am	9750am	9765am	9880as		0430-0500 s	Radio Zambia Int'l	9505af	11880af	17895af	
		9895as	11765me	11920me	11975am		0430-0500	TWR Swaziland	5055af	5965af	9655af	11750af
		12010me	12035as	12050am	13670am		0430-0500	VOA	5995me	6040me	6140me	7170me
		13745as	15280me	15295au	15350am				7200me	9715me		
		15420am	15425as	15470as	15520as		0430-0500	VOA	6035af	7405af	9575af	15115af
		17590as	17605as	17610am	17655am				17715af	21600af		
		17675as	17690am	17700am	17720am		0432-0500	FEBA Seychelles	17810me			
		17775as	17825am	17890am	21690as		0450-0500	Radio Havana Cuba	6180am	11760am	11820am	

SELECTED PROGRAMS

Sundays

- 0400 Radio For Peace Int'l: Radio New York International. See S 0330.
- 0408 Swiss Radio Int'l: Dateline. See S 0208.
- 0415 BBC: Feature. In "Children of Courage" this month, kids who have braved hardship and helped others.
- 0418 Swiss Radio Int'l: Swiss Shortwave Merry-Go-Round. See S 0218.
- 0430 BBC: Short Story. This month's selections: "The Shona Brothers" (9th); "Mammy" (16th); "Surviving On Mexican Shade" (23rd) (except 2nd: Seeing Stars, a monthly look at astronomy).
- 0430 Radio Australia: This Australia. Documentaries about the land "down under."
- 0445 BBC: Talks. Missing that prized old record? Write to Mike Read and he'll play it on the air — and "Replace A Disc" (through March 8th).

Mondays

- 0400 Radio For Peace Int'l. New Dimensions Radio. Innovative
thinkers and ideas on the leading edge of change.
0408 Swiss Radio Int'l. Feature. See S 0638.
0415 BBC. Feature. BBC reporters across the world head off in
search of a "Taxi" (through March 9th).
0430 BBC: Off The Shelf. This month's serialized readings are
two classics: Flaubert's "Madame Bovary" (3rd-21st) and

- Forster's "A Passage To India" (through March 13th).
0430 Radio Australia: Matters Of Faith. Dallas Adair examines
the doctrines and beliefs of Asian/Pacific faiths.
0445 BBC: Andy Kershaw's World Of Music. Exotic music from
the world over.

Tuesdays

- 0400 Radio For Peace Int'l: Peace Forum. Interviews and reports on what constitutes peace.
- 0408 Swiss Radio Int'l: Dateline. See S 0208.
- 0415 BBC: Health Matters. See T 0145.
- 0430 BBC: Off The Shelf. See M 0430.
- 0430 Radio Australia: World Of Country Music. A look at country music from all around the world.
- 0445 BBC: Talks. See M 2315.

Wednesdays

- 0400 Radio For Peace Int'l: World Of Radio. See S 0230.
0408 Swiss Radio Int'l: Dateline. See S 0208.
0415 BBC: Waveguide. Tips on how to hear the BBC better.
0425 BBC: Book Choice. A short review of a recently released book.
0430 BBC: Off The Shelf. See M 0430.
0430 Radio Australia: Music Of Radio Australia. See S 1113.
0430 Radio For Peace Int'l: RFPi's Mailbag. See S 0300.
0445 BBC: Country Style. See W 0145.

Thursdays

- 0400 Radio For Peace Int'l: New Dimensions Radio. See M 0400.
0408 Swiss Radio Int'l: Dateline. See S 0208.
0415 BBC: The Farming World. See H 0145.
0430 BBC: Off The Shelf. See M 0430.
0430 Radio Australia: Music Of Radio Australia. See S 1113.
0445 BBC: From Our Own Correspondent. See S 0330.

Fridays

- 0400 Radio For Peace Int'l: Alternative Radio. Current political issues facing Latin America.
0408 Swiss Radio Int'l: Dateline. See S 0208.
0415 BBC: Classical Music. See M 0145.
0430 BBC: Off The Shelf. See M 0430.
0430 Radio Australia: Communicator. See S 1430.
0445 BBC: Folk In Britain. See T 0130.

Saturdays

- 0400 Radio For Peace Int'l: World Of Radio. See S 0230.
0408 Swiss Radio Int'l: Dateline. See S 0208.
0415 BBC: Good Books. See W 1445.
0430 BBC: Jazz Now And Then. See A 0145.
0430 Radio Australia: Business Horizons. See T 1130.
0430 Radio For Peace Int'l: From The Atom To The Universe.
Robert Muller explains the effects of scientific research
on everyday life.
0445 BBC: WorldBrief. See F 2315.

0500 UTC

[12:00 AM EST/9:00 PM PST]

FREQUENCIES

0500-0600	ABC Brisbane	4920do	9660do		
0500-0600	ABC Perth	9610do			
0500-0530	BBC London	3255af	3955eu	6005af	6180as
		6190af	6195eu	7230eu	9410eu
		9600af	9640na	11760me	12095va
		15070as	15310as	15400af	15420af
		15590va	17885af	21470af	21715as
0500-0530	BBC London	5975na	15280as		
0500-0600	BBS Bahrain	6010me			
0500-0600	CFCX Montreal	6005do			
0500-0600	CFRX Toronto	6070do			
0500-0600	CKZU Vancouver	6160do			
0500-0530	CRTV Buea, Cameroon	3970do			
0500-0600	CSM World Svc, Boston	9455eu	9840eu	13760eu	17780va
0500-0550	Deutsche Welle	5960na	6045na	6120na	6130na
		9670na	9690na		
0500-0600	HCJB Quito	9745na	15155na		
0500-0515	Kol Israel	11588am			
0500-0600	KTBN Salt Lake City	7510am			
0500-0600	KVOH Los Angeles	9785am			
0500-0510 w	Malawi B'casting Corp.	3381do			
0500-0600 mtwhf	NBC Windhoek, Namibia	3270af	3290af		
0500-0600 sa	R. E. Africa, Eq Guinea	9585af			
0500-0600	R. for Peace Int'l	7375na	15030na		
0500-0600	Radio 2, Zambia	6165do	7235do		
0500-0600	Radio Australia	11880va	11930va	15160va	15170va
		15240va	15320pa	15365va	17630va
		17795va	21525va	21740va	21775va
0500-0600	Radio Beijing	11840am			
0500-0600	Radio Havana Cuba	5965am	6180am	11760am	11950am
0500-0600	Radio Japan	15195na	17765na	17810na	17825na
		17890na	21610na		
0500-0510	Radio Lesotho	4800do			
0500-0600	Radio Moscow World Svc	6175eu	7130eu	7135as	7150am
		7160as	7240as	7310am	7440au
		9450as	9535eu	9625as	9750as
		9760eu	9765am	9880as	11765as
		1195eu	12035as	12055me	13670am
		13745me	15295me	15350am	15375am
		15420am	15465eu	15470as	15520eu
		15530eu	15545as	17590as	17610au
		17635au	17655as	17675as	17690am
		17700am	17775as	17825am	17890am
		21565as	21680as	21690as	21790au
		21845as			

0500-0600	Radio Moscow World Svc	7270am	9505am	9895am	12010am
		12050am	15180am	17605am	17700am
		17720am			
0500-0600	Radio New Zealand Int'l	17770pa			
0500-0600	Radio Nigeria	3326do	4990do		
0500-0600	Radio Sofia, Bulgaria	11720eu	11765af		
0500-0600	Radio Thailand	4830as	9655as	11905as	
0500-0600 s	Radio Zambia Int'l	9505af	11880af	17895af	
0500-0600	RTM Malaysia	7295do			
0500-0600	SBC Radio 1, Singapore	5052do	11940do		
0500-0600	SLBS, Sierra Leone	3316do			
0500-0600	Spanish Foreign Radio	9530na			
0500-0530	TWR Swaziland	5965af	9655af	11750af	
0500-0530	Vatican Radio	9695af	11625af	15090af	
0500-0600	VOA	5995eu	6040me	6060eu	6140me
		7170me	7200me	9670me	9700eu
		9715me	11825me	15205me	
0500-0600	VOA	6035af	7405af	9575af	15115af
		17715af			
0500-0600	Voice of Kenya	4935do			
0500-0600	Voice of Nigeria	7255af			
0500-0600	WHRI Noblesville	7315na	9495sa		
0500-0600	WINB Red Lion, Penn.	15145eu			
0500-0600	WRNO New Orleans	7355am			
0500-0600	WWCR Nashville	7435na			
0500-0600	WYFR	5985am	9850eu	11915eu	13695af
0510-0515 w	Radio Botswana	5955af	7255af		
0520-0550	Fujian PBS, China	4975do	5040do		
0524-0600 f	Radio 2, Accra, Ghana	3366do			
0526-0600	Radio 1, Accra, Ghana	4915do			
0530-0600	BBC London	3255af	3955eu	5975na	6005af
		6180as	6190af	6195eu	7230eu
		9410eu	9600af	9640na	11760me
		12095va	15070as	15310as	15400af
		15420af	15590va	17885af	21470af
0530-0600	BBC London	15280as	21715as		
0530-0600	Cameroon Radio-TV	4850do			
0530-0600	Guizhou PBS Guiyang China	3260do	7275do		
0530-0600	Radio Romania Int'l	11830af	15380af	17720af	17745af
		17790af	21665af		
0530-0600	RAI Vienna	6015na	6155eu	13730eu	21490me
0530-0600	TWR Swaziland	5965af	11750af		
0530-0600	UAE Radio, Dubai	15435as	17830as	21700as	
0545-0600	Radio Buea, Cameroon	3970do			

SELECTED PROGRAMS

Sundays

- 0500 Radio For Peace Int'l: Radio New York International. See S 0330.
- 0513 Radio Australia: Back Page. See S 0313.
- 0530 Radio Australia: Interaction. Patti Orofino explores the experiences of multicultural Australia.
- 0530 Radio For Peace Int'l: Amnesty Int'l Reports or The Other Americas Radio. Human rights reports, or issues affecting Central and South America.

Mondays

- 0500 Radio For Peace Int'l: The CFRU Series. Current affairs issues from a student-radio viewpoint.
- 0513 Radio Australia: Music Of Radio Australia. See S 1113.
- 0530 Radio Australia: Music/Information. See S 0330.
- 0530 Radio For Peace Int'l: World Goodwill Forum. Goodwill organizations and their effects on the world.

Tuesdays

- 0500 Radio For Peace Int'l: Voices Of Our World. Interviews

and reports about exotic corners of the world.

- 0513 Radio Australia: Music Of Radio Australia. See S 1113.
- 0530 Radio Australia: Points Of Law. See M 1530.
- 0530 Radio For Peace Int'l: United Nations. See M 2330.
- 0545 Radio For Peace Int'l: Undercurrents. See S 1545.
- Wednesdays**
- 0500 Radio For Peace Int'l: Second Opinion. A weekly conversation with Erwin Knoll, editor of The Progressive.
- 0513 Radio Australia: Music Of Radio Australia. See S 1113.
- 0530 Radio Australia: Connections. See S 1530.
- 0530 Radio For Peace Int'l: Along The Color Line. Manning Marable looks at issues relevant to the black community.
- 0545 Radio For Peace Int'l: Undercurrents. See S 1545.

Thursdays

- 0500 Radio For Peace Int'l: The Practice Of Peacemaking. See S 0600.
- 0513 Radio Australia: Music Of Radio Australia. See S 1113.
- 0530 Radio Australia: AgriNews. See T 1530.

- 0530 Radio For Peace Int'l: United Nations. See M 2330.

- 0545 Radio For Peace Int'l: Undercurrents. See S 1545.

Fridays

- 0500 Radio For Peace Int'l: WINGS. Current affairs and analysis of women's issues.
- 0513 Radio Australia: Music Of Radio Australia. See S 1113.
- 0530 Radio Australia: Lane's Company. See T 1430.
- 0530 Radio For Peace Int'l: The Neumaier Report. Life experiences and opportunities from a spiritual perspective.
- 0545 Radio For Peace Int'l: Undercurrents. See S 1545.
- Saturdays**
- 0500 Radio For Peace Int'l: UNESCO. See T 0330.
- 0513 Radio Australia: Music Of Radio Australia. See S 1113.
- 0530 Radio Australia: Arts Roundabout. The arts in Australia, past and present.
- 0530 Radio For Peace Int'l: United Nations. See M 2330.
- 0545 Radio For Peace Int'l: Undercurrents. See S 1545.

0600 UTC

[1:00 AM EST/10:00 PM PST]

FREQUENCIES

0600-0630	BBC London	3955eu	6180eu	6190af	6195eu	0600-0630	Radio New Zealand Int'l	15180am	17720am
		7230eu	9410eu	9600af	11760me	0600-0700	Radio Nigeria	3326do	4990do
		11940af	11955as	12095eu	15070va	0600-0650	Radio Pyongyang	15180as	15230as
		15310as	15400af	15420af	15590va	0600-0615	Radio Sofia, Bulgaria	11720eu	11765eu
		17790as	17830as	17885af	21470af	0600-0700 sa	Radio Thailand	4830as	9655as 11905as
		5975na	7150pa	9640va	15280as	0600-0630 s	Radio Zambia Int'l	9505af	11880af 17895af
		15360pa	21715as			0600-0700 smtwha	RTM Malaysia	7295do	
0600-0700	BBS Bahrain	6010me				0600-0700	SBC Radio 1, Singapore	5010do	5052do 11940do
0600-0625	Cameroon Radio-TV	4850do				0600-0700	SLBS, Sierra Leone	3316do	
0600-0700	CFCX Montreal	6005do				0600-0700	TWR Swaziland	5965af	7200af 11750af
0600-0700	CFRX Toronto	6070do				0600-0700	V. of the Mediterranean	9765eu	
0600-0700	CKZU Vancouver	6160do				0600-0630	Vatican Radio	6245eu	7250eu
0600-0700	CSM World Svc, Boston	9455eu	9840eu	9870na	17555eu	0600-0700	VOA	3980eu	5995eu 6040eu 6060me
		17780va						6110eu	6140eu 7170me 7325me
0600-0650	Deutsche Welle	11765af	13610af	13790af	15185af			11805me	11825me 15205me
		15435af	17875af			0600-0700	VOA	6035af	6125af 7405af 9530af
0600-0700 tent	ELBC Monrovia, Liberia	7275do						9575af	15115af 17715af
0600-0700	HCJB Quito	9745na	15115na			0600-0625	Voice of Kenya	4935do	
0600-0700	King of Hope, Lebanon	6280me				0600-0700	Voice of Malaysia	6175as	9750as 15295as
0600-0700	KTBN Salt Lake City	7510na				0600-0700	WHRI Noblesville	7315eu	9495sa
0600-0700	KVOH Los Angeles	9785na				0600-0700 smtwhf	WMLK Bethel	9465eu	
0600-0610 s	Malawi B'casting Corp.	3381do				0600-0700	WWCR Nashville	7435na	7490na
0600-0630	Nat'l Radio of Laos	7112as				0600-0700	WYFR	5985am	7355eu 9680eu 13695af
0600-0700 sa	R. E. Africa, Eq. Guinea	9585af				0600-0630 s	ZLXA New Zealand	3935do	
0600-0700	R. for Peace Int'l	7375na	15030na			0615-0630 s	Radio Bertoua, Cameroon	4750do	
0600-0700	Radio 1, Accra, Ghana	4915do				0615-0630	Radio Korea World News	7550eu	15575me
0600-0700 f	Radio 2, Accra, Ghana	3366do				0615-0700 mtwhf	RCI Montreal	6050eu	6150eu 7155eu 9740eu
0600-0700	Radio 2, Zambia	6165do	7235do					9760me	11905me
0600-0700	Radio Australia	11880va	11930va	15160va	15240va	0625-0700	Voice of Kenya	4935do	
		15320va	15365va	17630va	17750va	0630-0700	BBC London	5975na	6180eu 6190af 6195eu
		17795va	21525va	21740va	21775va			7230eu	9410eu 9600af 9640pa
0600-0645 s	Radio Douala, Cameroon	4795do						11760me	11940af 11955as 12095eu
0600-0700	Radio Havana Cuba	11760am						15070va	15310as 15400af 15420af
0600-0700	Radio Korea	7275om	11810na	15170na				15590va	17830as 17885af 21470af
0600-0700	Radio Moscow World Svc	6175am	7130as	7150am	7160as			7150pa	15280as 15360pa 17790as
		7240as	7310am	9450am	9530am			21715as	
		9535as	9750am	9765am	11765as	0630-0700	Radio New Zealand Int'l	9770pa	
		11880as	11975am	12035as	12055as	0630-0700	Radio Polonia, Warsaw	7270eu	9675eu
		13670am	13745me	15280as	15295as	0630-0700	RAI Vienna	6015na	
		15350am	15375am	15420am	15465as	0630-0635 mtwhf	RTV Congolaise	7105do	9610do
		15470au	15520as	15530as	15545me	0630-0700	Swiss Radio Int'l	15430af	17565af 21770af
		15550me	15595me	17590as	17610as	0630-0700	Vatican Radio	9695af	11625af 15090af
		17635eu	17655me	17665am	17675am	0630-0700 smtwhf	ZLXA New Zealand	3935do	
		17690am	17700am	17775as	17825am	0645-0700	Ghana B'casting Corp.	6130af	
		17890am	21680as	21690as	21790au	0645-0700	Radio Romania Int'l	11940au	15335au 17720au 17805au
		21845as						21665au	
		5905am	7270am	9505am	9795am				
		9825am	9895am	12010am	12050am				

SELECTED PROGRAMS

Sundays

- 0600 Radio For Peace Int'l: The Practice of Peacemaking. Ian Harris on problems of violence in the world.
- 0615 BBC: Letter From America. Alistair Cooke presents his unique reflections on the USA.
- 0630 BBC: Jazz For The Asking. Digby Fairweather plays listener requests.
- 0630 Radio Australia: Fine Music Australia. See S 0230.
- 0630 Radio For Peace Int'l: Consider The Alternatives. High-level experts on current events topics.
- 0638 Swiss Radio Int'l: Feature. Programs broadcast on a rotating basis are "The Grapevine" (listener comment), "Supplement" (news analysis), and "Roundabout Switzerland" (travel/discovery).

Mondays

- 0615 BBC: Recording Of The Week. A personal choice from the new classical music releases.
- 0630 BBC: Feature. See S 1401.
- 0630 Radio Australia: This Australia. See S 0430.
- 0630 Radio For Peace Int'l: World Of Radio. See S 0230.
- 0638 Swiss Radio Int'l: Dateline. See S 0208.

Tuesdays

- 0600 Radio For Peace Int'l: New Dimensions Radio. See M 0400.
- 0615 BBC: The World Today. See M 1645.
- 0630 BBC: Rock/Pop Music. All month, Miss P brings reggae to the Beeb in "World Rankin".
- 0630 Radio Australia: Music Of Radio Australia. See S 1113.
- 0638 Swiss Radio Int'l: Dateline. See S 0208.

Wednesdays

- 0600 Radio For Peace Int'l: World Citizen's Hour. A wide variety of opinions, submitted by the citizens of the world.
- 0615 BBC: The World Today. See M 1645.
- 0630 BBC: Meridian. Events in the world of the arts.
- 0630 Radio Australia: Pacific Women. Conversations with Pacific women about their lives and concerns.
- 0638 Swiss Radio Int'l: Dateline. See S 0208.

Thursdays

- 0600 Radio For Peace Int'l: Sound Currents Of The Earth. See M 0230.
- 0615 BBC: The World Today. See M 1645.
- 0630 BBC: Sports International. See H 0230.
- 0630 Radio Australia: At Your Request. See S 0130.

- 0638 Swiss Radio Int'l: Dateline. See S 0208.

Fridays

- 0600 Radio For Peace Int'l: The Wisdom Of Joseph Campbell. See S 0200.
- 0615 BBC: The World Today. See M 1645.
- 0630 BBC: Meridian. See W 0630.
- 0630 Radio Australia: Music Of Radio Australia. See S 1113.
- 0630 Radio For Peace Int'l: Food For The Thoughtful. See M 0330.

- 0638 Swiss Radio Int'l: Dateline. See S 0208.

Saturdays

- 0600 Radio For Peace Int'l: Common Ground. International relations and related political and social issues.
- 0615 BBC: The World Today. See M 1645.
- 0630 BBC: Meridian. See W 0630.
- 0630 Radio Australia: Just Out. See M 0030.
- 0630 Radio For Peace Int'l: Second Opinion. See W 0500.
- 0638 Swiss Radio Int'l: Dateline. See S 0208.
- 0648 Swiss Radio Int'l: Swiss Shortwave Merry-Go-Round. See S 0218.

0700 UTC

[2:00 AM EST/11:00 PM PST]

FREQUENCIES

0700-0730	BBC London	1780as	5975na	7150pa	9640va	11955as
	15280as	15360pa	21715as	6180eu	6190af	6195eu
	7230eu	7325af	9410eu	9760eu	11760me	11940af
	12095eu	15070eu	15310as	15400af	15420af	15590eu
	17640va	17790as	17885af	21470af	21660af	
0700-0800	BBS Bahrain	6010me				
0700-0800	CFCX Montreal	6005do				
0700-0800	CFRX Toronto	6070do				
0700-0800	CKZU Vancouver	6160do				
0700-0800	CSM World Svc, Boston	9455eu	9840eu	9870pa	17555as	
		17780va				
0700-0800 tent	ELBC Monrovia, Liberia	7275do				
0700-0730	Georgian Radio, Tbilisi	12050me	12070au			
0700-0800	Ghana B'casting Corp.	6130af				
0700-0800	HCJB Quito	11835eu	15270eu	17790eu		
0700-0800	King of Hope, Lebanon	6280me				
0700-0800	KTBN Salt Lake City	7510na				
0700-0800	KVOH Los Angeles	9785na				
0700-0730 s	Latvian Radio, Riga	5935eu				
0700-0710 w	Malawi B'casting Corp.	3381do	5995do			
0700-0800 sa	R. E. Africa, Eq. Guinea	9585af				
0700-0800	R. for Peace Int'l	7375na	15030na			
0700-0800	Radio 1, Accra, Ghana	4915do				
0700-0800 f	Radio 2, Accra, Ghana	3366do				
0700-0800	Radio 2, Zambia	6165do	7235do			
0700-0800	Radio Australia	11880va	11930va	15240va	15320va	
		17630va	21525va	21740va	21775va	
0700-0710	Radio Bafoussam, Cameroon	4000do				
0700-0800	Radio Havana Cuba	11760am				
0700-0800	Radio Japan	15250me	17765eu	17810as	17890as	
		21525as				
0700-0800	Radio Moscow World Svc	6175am	7130as	7135as	7150am	
	7310am	9450eu	9530am	9535am	9750as	9765as
	9855as	11730as	11765as	11880au	11975as	12035me
	12055me	13670am	13745as	15280me	15295as	15350am
	15375am	15420as	15455me	15465me	15470as	15520au
	15530au	15545as	15550as	15560as	15595as	17570me
	17590me	17610eu	17615as	17635eu	17655am	17665am
	17680eu	17690am	17700am	17775am	17825eu	17845eu
	17890am	21680as	21690as	21785au	21790au	21845as
	5905am	7175am	7260am	7270am	7345am	9505am
	9795am	9825am	17720am			
0700-0800	Radio New Zealand Int'l	9700as				
0700-0800	Radio Nigeria	3326do	4990do			
0700-0750	Radio Pyongyang	15340as	17765as			
0700-0710	Radio Romania Int'l	11940au	15335au	17720au	17805au	
	21665au					
0700-0800 sa	Radio Thailand	4830as	9655as	11905as		
0700-0740	RadioCentras, Lithuania	9710eu				
0700-0800 smtwha	RTM Malaysia	7295do				
0700-0800	SBC Radio 1, Singapore	5010do	5052do	11940do		
0700-0800	SLBS, Sierra Leone	3316do				
0700-0800	TWR Monte Carlo	9480na				
0700-0800	TWR Swaziland	7200af	11750af			
0700-0800	V. of Free China, Taiwan	5950na				
0700-0800	Voice of Kenya	4935do				
0700-0800	Voice of Malaysia	6175as	9750as	15295as		
0700-0800	WHRI Noblesville	7315eu	9495sa			
0700-0800	WWCR Nashville	7435am				
0700-0800	WYFR	7355eu	9680eu	13695af		
0700-0800 smtwhf	ZXLA New Zealand	3935do				
0705-0800 a	Radio Douala, Cameroon	4795do				
0730-0800	BBC London	6180eu	6190af	7325eu	9410eu	9660eu
	9760eu	11760me	11860af	11940af	12095va	15070eu
	15105af	15400af	15420af	15590af	17640va	17830as
	17885af	21470af	21660af	7150pa	9640va	11955as
	15280as	15310as	15360pa	17790as	21715as	
0730-0755	BRT Brussels	5910au	11695eu	13675eu		
0730-0745 mtwhf	Icelandic National Radio	3295om	6100om	9265om		
0730-0800	R. New Zealand Int'l	9700pa				
0730-0745	Radio Finland	6120eu	9560af	11755eu		
0730-0800	Radio Netherlands	9630au	11895au			
0730-0800	Radio Prague	17840pa	21705as			
0730-0800	Swiss Radio Int'l	3985eu	6165eu	9535eu		
0730-0745 mtwhfa	Vatican Radio	6245do	7250do	9645na	15210na	
0740-0800	TWR Monte Carlo	9480eu				

0800 UTC

[3:00 AM EST/12:00 AM PST]

FREQUENCIES

0800-0900	ABC Brisbane	9660au				
0800-0830	BBC London	6180eu	6190af	7325eu	9410eu	
	9600af	9760eu	11760me	11860af	12095eu	15070eu
	15310as	15360pa	15400af	15420af	15590me	17790as
	17830as	17885af	21470af	21660af	7150pa	9640pa
	9660eu	11950af	11955as	15105af	15280as	17640va
	21715as					
0800-0900	BBS Bahrain	6010me				
0800-0900	CFCX Montreal	6005do				
0800-0900	CFRX Toronto	6070do				
0800-0900	CSM World Svc, Boston	9455va	9840va	13710va	13760va	
		17555va				
0800-0900	HCJB Quito	6205pa	9585pa	9610pa	9745pa	
		11835pa	11925pa			
0800-0900 a	IRRS Milan, Italy	7125eu				
0800-0900	King of Hope, Lebanon	6280me				
0800-0900	KNLS Anchor Point, Alaska	11715as				
0800-0900	KTRW Guam	15200as				
0800-0810 w	Malawi B'casting Corp.	3381do				
0800-0900 sa	R. E. Africa, Eq. Guinea	9585af				
0800-0900	R. for Peace Int'l	7375na	15030na			
0800-0900	Radio 1, Accra, Ghana	4915do				
0800-0900 f	Radio 2, Accra, Ghana	3366do				
0800-0900	Radio 2, Zambia	6165do	7235do			
0800-0900	Radio Australia	15160va	15240va	17630va		
		17750va	21775va			
0800-0810	Radio Bafoussam, Cameroon	4000do				
0800-0900 a	Radio Douala, Cameroon	4795do				
0800-0900	Radio Korea	7550eu	13670eu			
0800-0900	Radio Moscow World Svc	5960eu	7130as	7160as	7310am	
	9535as	9855as	11705as	11765as	11880eu	11975au
	12010eu	12055me	13705me	15295me	15345me	15350eu
	15375eu	15420am	15455am	15465as	15470as	15500me
	15520me	15530eu	15545me	15550me	15560eu	17570eu
	17590eu	17610as	17615as	17636eu	17655as	17665am
	17690am	17700am	17710as	17765am	17775as	17790as
	17810am	17825am	17890am	21680as	21690as	21725as
	21785as	21790au	21845as			
	5905am	7175am	7260am	7270am	7345am	9505am
	9635am	9795am	9825am	9905am		
0800-0825	Radio Netherlands	9630au	11895au			
0800-0900	Radio New Zealand Int'l	9700pa				
0800-0900	Radio Nigeria	3326do	4990do			
0800-0845	Radio Pakistan	17902eu	21520eu			
0800-0850	Radio Pyongyang	15180as	15230as			
0800-0900 smtwha	RTM Malaysia	7295do				
0800-0900	SBC Radio 1, Singapore	5010do	5052do	11940do		
0800-0900	SLBS, Sierra Leone	3316do				
0800-0900	TWR Monte Carlo	9480eu				
0800-0825	TWR Swaziland	7200af	11750af			
0800-0830	V. of Islam, Bangladesh	15195as	17815as			
0800-0900	VOA	11735eu	15160eu	15195me	21455me	
		21570me				
0800-0900	Voice of Indonesia	7125as	9675as	11752as	11785as	
0800-0900	Voice of Kenya	4935do				
0800-0825	Voice of Malaysia	6175as	9750as	15295as		
0800-0900	Voice of Nigeria	7255af				
0800-0900	WHRI Noblesville	7315eu	9495sa			
0800-0900	WWCR Nashville	7435am	7490na			
0800-0900 smtwhf	ZXLA New Zealand	3935do				
0827-0900	KTRW Guam	11805as				
0830-0900	AWR Italy	7230eu				
0830-0900	BBC London	6180eu	6190eu	7325eu	9410eu	9660eu
	9760eu	11860af	11940af	11955as	12095eu	15070va
	15280as	15360pa	15400af	15420af	15590me	17640va
	17830as	21660af	21715as	17885af		
0830-0900	Radio Netherlands	11895pa	17575as	21485as		
0830-0900	RAI Vienna	6155eu	13730eu	15450au	21490as	
0830-0900	Swiss Radio International	9560as	13685as	17670as	21695as	
0830-0845	Vatican Radio	6245eu	7250eu	9645eu	15210eu	
0835-0850 mtwhf	TWR Swaziland	7200af	11750af			
0840-0850 mtwhfa	Voice of Greece	15650au	17525au			

0900 UTC

[4:00 AM EST/1:00 AM PST]

1000 UTC

[5:00 AM EST/2:00 AM PST]

FREQUENCIES

0900-1000 s	AWR Italy (via Portugal)	9670eu			
0900-0930	BBC London	1170as	5975eu	6045eu	6180u
	6190af	6195as	7325eu	9410eu	9660eu
	9750eu	9760eu	11760me	11860af	11940af
	15070va	15400af	17640va	21660af	15190sa
	15310as	15360as	15420af	15575me	15590me
	17790af	17830as	17885af	21470af	21660af
0900-1000	BBS Bahrain	6010me			
0900-1000 s	BBS, Bhutan	6035do			
0900-1000	CFCX Montreal	6005do			
0900-1000	CFRX Toronto	6070do			
0900-1000	CKZU Vancouver	6160do			
0900-1000	CSM World Svc, Boston	9455va	9840va	13710va	13760va
	17555va				
0900-0950	Deutsche Welle	6160as	9565af	11915as	15410af
		17780as	17820as	21465as	21600af
		21650as	21680as		
		9800as	11685as		
0900-1000	FEBC Manila	9745va			
0900-1000	HCJB Quito	7125eu			
0900-1000 a	IRRS Milan, Italy	6280me			
0900-1000	King of Hope, Lebanon	15200as			
0900-0927	KTRW Guam	11805as			
0900-1000	KTRW Guam	5995do			
0900-0910	Malawi B'casting Corp.	9585af			
0900-1000 sa	R. E. Africa, Eq. Guinea	7375na	15030na		
0900-0930	R. for Peace Int'l	4915do			
0900-0905	Radio 1, Accra, Ghana	3366do			
0900-0905 f	Radio 2, Accra, Ghana	6165do	7235do		
0900-1000	Radio 2, Zambia	7140va	9580va	11800va	13605va
0900-1000	Radio Australia	15160va	15170va	17750va	25750va
		11755au	15440au	17710au	
0900-1000	Radio Beijing	15245as	17800pa		
0900-0950	Radio Finland	15270au	17890au		
0900-1000 Ra	Radio Japan	11840as	21610as		
0900-1000	Radio Moscow World Svc	5960eu	7130eu	7310am	9535eu
	11705me	11765me	11920eu	11975me	12010me
	13705as	15295eu	15345as	15350as	15420am
	15455as	15465am	15470as	15500as	15530as
	15550eu	15580as	17570eu	17580as	17605eu
	17635eu	17655as	17665as	17610am	17690am
	17700am	17710as	17765as	17775as	17790as
	17870am	17880as	21680as	21690as	21725as
	21790au	21845as			21785as
0900-1000	Radio New Zealand Int'l	9700pa			
0900-1000	Radio Nigeria	3326do	4990do		
0900-1000	Radio Tanzania	5985af	9685af	11765af	
0900-0915	Radio Voice of Lebanon	6550me			
0900-1000	RTM Malaysia	7295do			
0900-1000	SBC Radio 1, Singapore	5010do	5052do	11940do	
0900-1000	SLBS, Sierra Leone	3316do			
0900-1000	TWR Monte Carlo	9480eu			
0900-1000	VOA	11735eu	15160eu	15195me	21455me
		21570eu			
0900-1000	Voice of Kenya	4935do			
0900-1000	Voice of Nigeria	7255af			
0900-1000	WWCR Nashville	7435am			
0900-0930 mtwhf	ZLXA New Zealand	3935do			
0905-1000	Cameroon Radio-TV	4850do			
0905-1000 mtwhf	R. 2 Schools Prg., Ghana	7295do			
0905-1000 sa	Radio 1, Accra, Ghana	4915do			
0905-1000 sa	Radio 2, Accra, Ghana	3366do			
0910-0940 smwha	Ulaanbaatar R., Mongolia	11850pa	12015pa		
0915-0939	Al-Quds Radio (cland.)	5900om	5990om		
0915-0930	Radio Korea World News	9570am	13670eu		
0920-1000	BFBS British Forces	15245me	17830me	21745me	
0925-0955	Radio Finland	15245as	17800au		
0930-1000	BBC London	5975eu	6045eu	6180eu	6190af
	6195as	9410eu	9660eu	9740as	9750eu
	11750as	11760me	11940af	12095eu	15070va
	15400af	15420af	15575me	15590me	15190sa
	17705eu				17705eu
0930-1000	Radio Afghanistan	4940as	9635as	15140as	17720as
0930-1000	Radio Netherlands	11895pa			
0930-0940	RTV Togo	7265do			
0950-0953 a	R. Sta Pacific Ocean Vladivostok	4050do	4485do	5015do	
	5905do	6035do	6175pa	7175pa	7210pa
	7270pa	7345pa	9530pa	9600pa	9635pa
	9905pa	11815pa	15535pa	15595pa	17620pa
	17695pa	17825pa	17850pa		

FREQUENCIES

1000-1100	All India Radio, Delhi	15050as	15335as	17387as	17865as
		21735as			
1000-1030	BBC London	5975eu	6045eu	6180eu	6190af
	6195as	9410eu	9660eu	9740as	9750eu
	11750as	11760me	11940af	12095eu	15070va
	15310as	15400af	15420af	15575me	17640va
	17790af	17885af	21470af	21660af	21715as
1000-1100	BBS Bahrain	6010me			
1000-1025 mtwhf	BRT Brussels	9855eu	13675eu	21815af	
1000-1100	Cameroon Radio-TV	4850do			
1000-1100	CFCX Montreal	6005do			
1000-1100	CFRX Toronto	6070do			
1000-1100	CKZU Vancouver	6160do			
1000-1100	CSM World Svc, Boston	9455va	9495va	13625va	17555va
1000-1100	FEBC Manila	9800as	11665as		
1000-1100	HCJB Quito	9745pa	11925pa		
1000-1100	KSDA Guam	11980as			
1000-1100 mtwhf	R. 2 Schools Prg., Ghana	7295do			
1000-1100 sa	R. E. Africa, Eq. Guinea	9585af			
1000-1100	R. for Peace, Int'l	7375na	15030na		
1000-1100 sa	Radio 1, Accra, Ghana	4915do			
1000-1100 sa	Radio 2, Accra, Ghana	3366do			
1000-1100	Radio 2, Zambia	6165do	7235do		
1000-1030	Radio Afghanistan	4940as	9635as	15140as	17720as
1000-1100	Radio Australia	9580pa	11800pa	15160va	15170va
		25750va			
1000-1100	Radio Beijing	11755au	15440au	17710au	
1000-1100	Radio Moscow World Svc	6000am	7130as	7245as	9535eu
	9780eu	9855eu	11705me	11765me	11920eu
	12010me	12055me	13705as	15175am	15280as
	15345am	15350am	15435as	15455as	15465as
	15490eu	15500eu	15530as	15540as	15550as
	15595me	17565as	17570as	17605as	17610eu
	17665am	17670as	17675as	17690am	17695as
	17765as	17775as	17790as	17810am	17870as
	21680as	21690as	21725as	21785as	21800au
					21845as
1000-1025	Radio Netherlands	11895pa			
1000-1025	Radio Netherlands	11895pa	21485as		
1000-1100	Radio New Zealand Int'l	9700pa			
1000-1100	Radio Nigeria	4990do	7285do		
1000-1100	Radio RSA, Johannesburg	15230af			
1000-1030	Radio Tanzania	5985af	9685af	11765af	
1000-1100 mtwhf	RTM Malaysia	7295do			
1000-1100	SBC Radio 1, Singapore	5010do	5052do	11940do	
1000-1100	SLBS, Sierra Leone	3316do			
1000-1030	Swiss Radio International	9560as	13685as	17670as	21695as
1000-1100	TWR Costa Rica	9725ca			
1000-1015	TWR Monte Carlo	9480eu			
1000-1100	VOA	5985as	11720au	15425au	
1000-1100	VOA	6095am	9590am	11915am	
1000-1100	VOA	11735eu	15160af	15195eu	21455eu
		21570eu			
1000-1100	Voice of Kenya	4935do			
1000-1100	Voice of Nigeria	7255af			
1000-1030	Voice of Vietnam	9840as	15010as		
1000-1100	WWCR Nashville	7435na			
1000-1100	WYFR	5950am			
1030-1100	BBC London	5975eu	6045eu	6180eu	6190af
	6195as	9410eu	9660eu	9740as	9750eu
	11750as	11760me	11940af	12095eu	15070va
	15310as	15400af	15420af	15575me	17640va
	17790af	17885af	21470af	21660af	21715as
1030-1040 mtwhf	Malawi B'casting Corp.	5995do			
1030-1100	Radio Korea	11715na			
1030-1100 sa	Radio Tanzania	5985af	9685af	11765af	
1030-1100	Radio Zambia Int'l	9505af	11880af	17895af	
1030-1100	Sri Lanka B'casting Corp.	11835as	15120as	17850as	
1030-1100	UAE Radio, Dubai	13675eu	15320eu	15435as	21605as
1040-1050 mtwhf	Voice of Greece	15650as	17525as		
1055-1100	TWR Bonaire	11815am	15345am		

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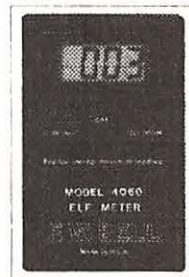
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1100 UTC

[6:00 AM EST/3:00 AM PST]

FREQUENCIES

1100-1200	AWR Costa Rica	9725ca				1100-1130	Radio Mozambique	9525af	11818af	11835af
1100-1130	BBC London	5965na	6045eu	6180eu	6190af	1100-1120	Radio Pakistan	17902eu	21520eu	
		6195eu	9410eu	9515na	9660eu	1100-1150	Radio Pyongyang	6576am	9977am	11335am
		9740as	9750eu	9760eu	11750as	1100-1200	Radio RSA, Johannesburg	9555af	11860af	11900af
		11760me	11940af	12095eu	15070va	1100-1200	RTM Malaysia	7295do	7160do	
		15310as	15400af	15420af	15575me	1100-1200	SBC 1, Singapore	5010do	5052do	11940do
		15220na	17640va	17705eu	17790af	1100-1130	Sri Lanka B'casting Corp.	11835as	15120as	17850as
		17885af	21470af	21660af		1100-1130	Swiss Radio Int'l	13635as	15505as	17670as 21770as
1100-1200	BBS Bahrain	6010me				1100-1200	TWR Boanire	11815am	15345am	
1100-1200	CFCX Montreal	6005do				1100-1200	TWR Bonaire	11815am	15345am	
1100-1200	CFRX Toronto	6070do				1100-1200	VOA	5985as	6110au	9760as 11720au
1100-1200	CSM World Svc, Boston	9455eu	9495eu	13625pa	17555pa			15155au	15425as	
1100-1150	Deutsche Welle	15410af	17765af	17800af	17860af	1100-1200	VOA	6095am	9590am	11915am
		21465af	21600af			1100-1130	Voice of Vietnam	7416as	9732as	
1100-1200	HCJB Quito Ecuador	11925am	15115am	17890am	21455am	1100-1200	WHRI Noblesville	9465na		
1100-1130	Kol Israel	11588eu	17545am			1100-1200	WWCR Nashville	7435na		
1100-1200	KTBN Salt Lake City	7510na				1100-1200	WYFR	5950am	7355am	
1100-1110 sa	Malawi B'casting Corp.	5995do				1115-1130	R. Korea World News Svc.	7275as	11740as	
1100-1110 mtwhf	R. 2 Schools Prg., Ghana	7295do				1115-1145	Radio Nepal, Katmandu	3230as	5005as	7165as
1100-1200	R. for Peace, Int'l	7375na	15030na			1120-1140	Hunan PBS Changs ha China		4892va	
1100-1200	Radio 1, Accra, Ghana	4915do				1125-1130 sa	Radio Botswana	5955af	7255af	
1100-1200 sa	Radio 2, Accra, Ghana	3366do				1130-1200	AWR Italy	7230eu		
1100-1200	Radio Australia	6080va	7140va	7240va	9580va	1130-1200	BBC London	5965na	6045eu	6180eu 6190af
		9710va	11930va	13605va	15170va			6195eu	9410eu	9515na 9660eu
		21720va						9740as	9750eu	9760eu 11750as
1100-1200	Radio Japan	6120na	11815sa	11840na				11760me	11940af	12095eu 15070va
1100-1200	Radio Korea World News	15575af						15220na	15310as	15420af 15575me
1100-1200	Radio Moscow World Svc	6000am	7130eu	7245as	9705as			17640va	17705eu	17790af 17885af
		9780eu	9855eu	11700as	11705me			21470af		
		11765me	11920me	12010me	12055as	1130-1140	Radio Lesotho, Maseru	4800do		
		15175am	15280as	15345am	15455as	1130-1200	Radio Netherlands	5955eu	9715eu	17575eu 21480eu
		15465as	15470as	15500eu	15520eu		21520eu			
		15550as	17555as	17570as	17575as	1130-1200	Radio Thailand	4830as	9655as	11905as
		17605am	17655as	17665am	17670as	1130-1200	RAI Vienna	6155eu	11780as	13730va 15450as
		17675me	17690as	17695am	17700am	1130-1200	VOIRI Teheran	7215me	9575as	9695me 11790as
		17710au	17780au	17790as	17810am			11930as		
		17870as	17880as	21680as	21725as	1145-1200	Radiodiffusion du Burundi	6140af		
		21785as	21800au							

SELECTED PROGRAMS

Sundays

- 1100 Radio For Peace Int'l: RFPI's Mailbag. See S 0300.
 1108 Swiss Radio Int'l: Feature. See S 0638.
 1113 Radio Australia: Music Of Radio Australia. Selections by Radio Australia announcers.
 1130 BBC: The Ken Bruce Show. See S 0030.
 1130 Radio Australia: One World. Michael Wagner reports on environmental issues of the Asian/Pacific region.
 1130 Radio For Peace Int'l: Radio New York International. See S 0330.

Mondays

- 1100 Radio For Peace Int'l: Sound Currents Of The Earth. See M 0230.
 1108 Swiss Radio Int'l: Dateline. See S 0208.
 1113 Radio Australia: Music Of Radio Australia. See S 1113.
 1130 BBC: Composer Of The Month. See M 0230.
 1130 Radio For Peace Int'l: Food For The Thoughtful. See M 0330.

Tuesdays

- 1100 Radio For Peace Int'l: The CFRU Series. See M 0500.
 1108 Swiss Radio Int'l: Dateline. See S 0208.
 1113 Radio Australia: Music Of Radio Australia. See S 1113.
 1130 BBC: Megamix. Music, sports, fashion, health, travel, news, and opinion for young people.

- 1130 Radio Australia: Business Horizons. Business and trade in the Asian/Pacific region.
 1130 Radio For Peace Int'l: UNESCO. See T 0330.
 1145 Radio For Peace Int'l: Undercurrents. See S 1545.

Wednesdays

- 1100 Radio For Peace Int'l: Visions For A Better World. See M 0200.
 1108 Swiss Radio Int'l: Dateline. See S 0208.
 1113 Radio Australia: Music Of Radio Australia. See S 1113.
 1130 BBC: Meridian. See W 0630.
 1130 Radio Australia: Science File. News about developments in science, medicine, and technology in Oceania.
 1130 Radio For Peace Int'l: United Nations. See M 2330.
 1145 Radio For Peace Int'l: Undercurrents. See S 1545.

Thursdays

- 1100 Radio For Peace Int'l: Changemakers. See S 2300.
 1108 Swiss Radio Int'l: Dateline. See S 0208.
 1113 Radio Australia: Music Of Radio Australia. See S 1113.
 1130 BBC: Drama. This month, "September Song" has the story of two diametrically opposed best friends, Billy and Ted, on an excellent adventure. Really!
 1130 Radio Australia: AgriNews. See T 1530.
 1130 Radio For Peace Int'l: UNESCO. See T 0330.
 1145 Radio For Peace Int'l: Undercurrents. See S 1545.

Fridays

- 1100 Radio For Peace Int'l: Feature. See F 0300.
 1108 Swiss Radio Int'l: Dateline. See S 0208.
 1113 Radio Australia: Music Of Radio Australia. See S 1113.
 1130 BBC: Meridian. See W 0630.
 1130 Radio Australia: Connections. See S 1530.
 1130 Radio For Peace Int'l: UNESCO. See T 0330.
 1145 Radio For Peace Int'l: Undercurrents. See S 1545.

Saturdays

- 1100 Radio For Peace Int'l: New Dimensions Radio. See M 0400.
 1108 Swiss Radio Int'l: Dateline. See S 0208.
 1113 Radio Australia: Music Of Radio Australia. See S 1113.
 1118 Swiss Radio Int'l: Swiss Shortwave Merry-Go-Round. See S 0218.
 1130 BBC: Meridian. See W 0630.
 1130 Radio Australia: Matters Of Faith. See M 0430.
 1130 Radio For Peace Int'l: United Nations. See M 2330.
 1145 Radio For Peace Int'l: Undercurrents. See S 1545.

[7:00 AM EST/4:00 AM PST]

1200-1300	ABC Brisbane	4920au			
1200-1300	ABC Perth	9610na			
1200-1300	AWR Costa Rica	9725ca			
1200-1230	BBC London	6045eu	6180eu	6190af	6195eu
		9410eu	9515na	9660eu	9740na
		9750eu	9760eu	11750as	11760me
		11940af	12095eu	15070eu	15220na
		15310as	15420af	15575me	17640va
		17705eu	17790af	17885af	21470af
		21660af			
1200-1300	BBS Bahrain	6010me			
1200-1300	CFCX Montreal	6005do			
1200-1300	CFRX Toronto	6070do			
1200-1300	CKZU Vancouver	6160do			
1200-1300	CSM World Svc, Boston	9495am	13625am	13710am	13760eu
1200-1300	HCJB Quito	11925am	15115am	17890am	21455om
1200-1300	KTBN Salt Lake City	7510am			
1200-1210 w	Malawi B'casting Corp.	3381do	5995do		
1200-1300 sa	R. E. Africa, Eq. Guinea	9585af			
1200-1300	R. for Peace, Int'l	15030na	21465na		
1200-1300	Radio 1, Accra, Ghana	4915do			
1200-1225 sa	Radio 2, Accra, Ghana	3366do			
1200-1300	Radio Australia	5995va	6080va	7240va	9580va
		9710va	11720pa	21720va	
1200-1300	Radio Beijing	9665am			
1200-1300	Radio Beijing	11600pa	15450pa		
1200-1300	Radio Beijing	9715as	11660as		
1200-1300 mtwhf	Radio Douala, Cameroon	4795do			
1200-1230	Radio Mogadishu, Somalia	6095af			
1200-1300	Radio Moscow World Svc	6000am	7130eu	7245as	9705as
		9780as	9855eu	11705me	11765as
		11920as	12055me	15280as	15345am
		15350am	15435as	15465am	15480eu
		15490eu	15500as	15535as	15550au
		17565as	17570as	17605as	17610am
		17635as	17655as	17665am	17675as
		17690am	17695as	17700am	17710am
		17780m	17790as	17810am	17840as
		17860as	17870as	17880as	21680as
		21725as	21785as	21800au	
1200-1225	Radio Netherlands	5955eu	9715eu	17575eu	21480eu
		21520eu			
1200-1210	Radio New Zealand Int'l	9700pa			
1200-1300	Radio Nigeria	4990do	7285do		

1200-1230 as	Radio Norway	21695as	25730as		
1200-1255	Radio Polonia, Warsaw	9525eu	11815eu		
1200-1230	Radio Romania Int'l	15340as	15365as	17730as	
1200-1300 sa	Radio Tanzania	5985af	9684af	11765af	
1200-1230	Radio Tashkent	5945as	9540as	15470as	17745as
1200-1230	Radio Thailand	4830as	9655as	11905as	
1200-1230 s	Radio Zambia Int'l	9505af	11880a	f 17895af	
1200-1300	RTM Malaysia	7295do			
1200-1300	SBC Radio 1, Singapore	5010do	5052do	11940do	
1200-1300	SLBS, Sierra Leone	3316do	5980do		
1200-1300	TWR Bonaire	11815am	15345am		
1200-1300	TWR Bonaire	11815am	15345am		
1200-1230 smwha	Ulaanbaatar R., Mongolia	11850as	12015as		
1200-1215	V. of Cambodia	9695as	11938as		
1200-1230	VOA	6110as	9760au	11715as	15155au
		15425			
1200-1300	Voice of Kenya	4935do			
1200-1300	Voice of Nigeria	7255af			
1200-1230	VOIRI Teheran	7215me	9575as	9695me	11790as
		11930as			
1200-1300	WHRI Noblesville	7315am	9465am		
1200-1300	WWCR Nashville	7435am	7490am		
1200-1300	WYFR	5950am	7355am	9705am	11830am
		17760am			
1215-1230	Radio Bayrak, Cyprus	6150va			
1215-1300	Radio Cairo	17595as			
1215-1300	Radio Korea	9750am			
1226-1300	Radio 2, Accra, Ghana	7295do			
1230-1300	BBC London	6045eu	6180eu	6190af	6195ca
		9410eu	9515na	9660eu	9740na
		9750eu	9760eu	11760me	11940af
		12095eu	12170as	15070eu	15220na
		15310as	15420af	15575me	17640va
		17705eu	17790af	17885af	21470af
		21660af			
1230-1255 S	BRT Brussels	21810na			
1230-1300	Radio Bangladesh	15200as	15605as	15647as	17750as
1230-1300	Radio Federal Yugoslavia	17710as	17740am	21605pa	
1230-1300 mtwhf	Radio Finland	15400na			
1230-1300	Radio France Int'l	9805eu	11670eu	15195eu	15425eu
		21635na	21645na		
1230-1300	Sri Lanka B'casting Corp.	6075as	9720as		
1230-1300	VOA	6110as	9760au	11715au	15155as
		15425as			
1230-1300	Voice of Vietnam	9840as	12020as	15010as	
1235-1245	Voice of Greece	15550na	15650na	17525na	

1200 Radio For Peace Int'l: Radio New York International. See S 0330.

1201 BBC: Play Of The Week. See S 0101.

1227 Radio Australia: Tattsloito Results. And tonight's winning numbers are...

1230 Radio Australia: Soundabout. Young, contemporary music from Australia and around the world.

Mondays

1200 Radio For Peace Int'l: New Dimensions Radio. See M 0400.

1215 BBC: Quiz. In this month's game show, decide whether contestants are telling the truth or it's all just a big "Hoax" (through March 2nd).

1230 Radio Australia: Soundabout. See S 1230.

1230 Radio Finland: Business Monday. See M 0230.

1240 Radio Finland: Press Review. A roundup of current stories in the Finnish press.

1245 BBC: Sports Roundup. See S 0315.

1245 Radio Finland: Airmail. See M 0240.

Tuesdays

1200 Radio For Peace Int'l: Peace Forum. See T 0400.

1215 BBC: Multitrack 1: Top 20. See M 2330.

1230 Radio Australia: Soundabout. See S 1230.
1230 Radio Finland: Northern Report. See T 0230.
1240 Radio Finland: Press Review. See M 1240.
1245 BBC: Sports Roundup. See S 0315.
1245 Radio Finland: Highlights. See T 0245.

Wednesdays

1200 Radio For Peace Int'l: World Of Radio. See S 0230.
1215 BBC: New Ideas. See M 1615.
1227 Radio Australia: Tattsлото Results. See S 1227.
1230 Radio Australia: Soundabout. See S 1230.
1230 Radio Finland: Northern Report. See T 0230.
1230 Radio For Peace Int'l: RFPI's Mailbag. See S 0300.
1235 BBC: Talks. See M 1635.
1240 Radio Finland: Press Review. See M 1240.
1245 BBC: Sports Roundup. See S 0315.
1245 Radio Finland: Sports Fare. See W 0245.

Thursdays

1200 Radio For Peace Int'l: New Dimensions Radio. See 0400.
1215 BBC: Multitrack 2. See W 2330.
1230 Radio Australia: Soundabout. See S 1230.
1230 Radio Finland: Northern Report. See T 0230.
1240 Radio Finland: Press Review. See M 1240.

1245 BBC: Sports Roundup. See S 0315.
1245 Radio Finland: Roots In Finland. See H 0245.

Fridays

1200 Radio For Peace Int'l: Alternative Radio. See F 0400.
1215 BBC: Feature. The Beeb enters the sty and the kennel to consider animal rights: "Do Pigs Equal Poets?" (7th); find out about what will be the world's largest business in "Tourism" (through March 6th).
1230 Radio Australia: This Australia. See S 0430.
1230 Radio Finland: Northern Report. See T 0230.
1240 Radio Finland: Press Review. See M 1240.
1245 BBC: Sports Roundup. See S 0315.
1245 Radio Finland: Names In The News. See F 0245.

Saturdays

1200 Radio For Peace Int'l: World Of Radio. See S 0230.
1215 BBC: Multitrack 3. See F 2330.
1227 Radio Australia: Tattsлото Results. See S 1227.
1230 Radio Australia: Women In Politics. See A 0330.
1230 Radio For Peace Int'l: From The Atom To The Universe. See A 0430.
1245 BBC: Sports Roundup. See S 0315.

1300 UTC

[8:00 AM EST/5:00 AM PST]

FREQUENCIES

1300-1400	ABC Brisbane	4920au				1300-1400	Radio SPLA, Sudan	11710af			
1300-1400	ABC Perth	9610				1300-1400 sa	Radio Tanzania	5985af	9684af	11765af	
1300-1330	BBC London	5975eu	6045eu	6180eu	6190af	1300-1400 mtwhf	RCI Montreal	9635am	11855am	17820am	
		6195ca	9410eu	9515na	9660eu	1300-1400	RTM Malaysia	7295do			
		9740as	9750eu	9760eu	11750as	1300-1400	SBC Radio 1, Singapore	5010do	5052do	11940do	
		11760me	11820as	11940af	12095eu	1300-1400	SLBS, Sierra Leone	3316do	5980do		
		15070va	15310as	15420af	15575me	1300-1400	Sri Lanka B'casting Corp.	6075as	9720as		
		7180as	15220na	17640va	17705eu	1300-1330	Swiss Radio Int'l	6165eu	9535eu	12030eu	
		17790af	17885af	21470af	21660af	1300-1330 as	TWR Bonaire	11815am	15345am		
						1300-1330	TWR Boniare	11815am	15345am		
1300-1400	BBS Bahrain	6010me				1300-1330	VOA	6110as	9760au	11715as	15155au
1300-1400	CFCX Montreal	6005do						15425au			
1300-1400	CFRX Toronto	6070do				1300-1325	Voice of Kenya	4935do			
1300-1400	CKZU Vancouver	6160do				1300-1400	Voice of Nigeria	7255af			
1300-1400	CSM World Svc, Boston	9495as	13625pa	13710pa	13760eu	1300-1400	WHRI Noblesville	9465	11790		
1300-1400	FEBC Manila	11685pa				1300-1400	WWCR Nashville	15690			
1300-1400	FEBC Manila	11995as				1300-1400	WYFR	5950am	7355am	9705am	11830am
1300-1400	HCJB Quito	11925am	15115am	17890am	21455am			17760am			
1300-1400	KNLS Alaska	7355as				1300-1400	WYFR	11550as			
1300-1400	KTN Salt Lake City	7510				1315-1330	Radio Voice of Lebanon	5me	6549.5		
1300-1400 sa	R. E. Africa, E. Guinea	9585af				1320-1400	Radio Jordan	9560na			
1300-1400	R. for Peace, Int'l	15030na	21465na			1325-1400 mtwhf	Voice of Kenya	4935do			
1300-1330	R. SPLA (Sudanese cland.)	11710om				1330-1400	All India Radio, Delhi	9565as	11760as	15335as	
1300-1400	Radio 1, Accra, Ghana	4915do				1330-1400	BBC London	5975eu	6045eu	6180eu	6190af
1300-1400	Radio 2, Accra, Ghana	7295do						6195ca	9410eu	9515na	9660eu
1300-1400	Radio Australia	5995va	6080va	7240va	9580va			9740as	9750eu	9760eu	11750as
		9710va	11720va	21720va				11820as	11940af	12095eu	15070va
1300-1400	Radio Beijing	11600pa						15220na	15310as	15420af	15575me
1300-1400	Radio Beijing	9715as	11600as					7180as	17640va	17705eu	17790af
1300-1330	Radio Cairo	17595as						17885af	21470af	21660af	
1300-1330 mtwhf	Radio Douala, Cameroon	4795do				1330-1400	Fujian PBS, China	2340do	4975do	5040do	
1300-1315	Radio Korea, Seoul	9750na				1330-1400	Nat'l Radio of Laos	7112as			
1300-1400	Radio Moscow World Svc	4810do	5940eu	5950eu	5960eu	1330-1400	Radio Douala, Cameroon	4795do			
		7130eu	7160eu	7245as	7260as	1330-1350 mtwhf	Radio Finland	15400na	21550na		
		7380as	9560as	9705as	9780eu	1330-1345	Radio Korea World News	7275as	11740as		
		9855eu	9885eu	9895as	11705me	1330-1400 a	Radio Republik Indonesia	3385do	6070do		
		11765me	11840am	11920as	12025me	1330-1400	Radio Sweden	17740as	21570as		
		13705me	15280me	15345am	15480as	1330-1400	Radio Tashkent	5945as	9540as	15470as	17745as
		15535as	17570me	17605me	17635as	1330-1400	RAI Vienna	11780as	15450as		
		17655me	17665as	17690am	17700am	1330-1357	RCI Montreal	6095as	6150as	9535as	9700as
		17780me	17790as	17810am	17840as	1330-1400	Swiss Radio Int'l	7480as	11690as	13635as	15505as
		17860as	17870as	21680as	21725as			17830as	21695as		
		21785as	21800au			1330-1400	UAE Radio, Dubai	13675eu	15320eu	15435as	21605as
1300-1400	Radio Nigeria	4990do	7285do			1330-1400 VOA	VOA	6110as	9760as	15155au	15425au
1300-1330 as	Radio Norway	9590eu	25730eu			1330-1400	Voice of Turkey	9675eu			
1300-1350	Radio Pyongyang	9345eu	9640eu	13650as	15230as	1330-1400	Voice of Vietnam	9840as	12020as	15010as	
1300-1400	Radio Romania Int'l	11940eu	15365eu	17720eu	21665eu	1345-1400	Vatican Radio	9600au	15090au	17525au	

SELECTED PROGRAMS

Sundays

- 1300 Radio For Peace Int'l: Radio New York International. See S 0330.
 1308 Swiss Radio Int'l: Feature. See S 0638.
 1313 Radio Australia: Sports Report. Results and reports on sporting events from the world over.
 1330 Radio Australia: Fine Music Australia. See S 0230.
 1330 Radio For Peace Int'l: Amnesty Int'l Reports or The Other Americas Radio. See S 0530.
 1338 Swiss Radio Int'l: Feature. See S 0638.

Mondays

- 1300 Radio For Peace Int'l: The CFRU Series. See M 0500.
 1308 Swiss Radio Int'l: Dateline. See S 0208.
 1313 Radio Australia: Sports Report. See S 1313.
 1330 Radio Australia: Music Of Radio Australia. See S 1113.
 1330 Radio Finland: Business Monday. See M 0230.
 1330 Radio For Peace Int'l: World Goodwill Forum. See M 0530.
 1338 Swiss Radio Int'l: Dateline. See S 0208.
 1340 Radio Finland: Press Review. See M 1240.
 1345 Radio Finland: Airmail. See M 0240.

Tuesdays

- 1300 Radio For Peace Int'l: Voices Of Our World. See T 0500.
 1308 Swiss Radio Int'l: Dateline. See S 0208.
 1313 Radio Australia: Sports Report. See S 1313.
 1330 Radio Australia: Music Of Radio Australia. See S 1113.
 1330 Radio Finland: Northern Report. See T 0230.

- 1330 Radio For Peace Int'l: United Nations. See M 2330.
 1338 Swiss Radio Int'l: Dateline. See S 0208.
 1340 Radio Finland: Press Review. See M 1240.
 1345 Radio Finland: Highlights. See T 0245.
 1345 Radio For Peace Int'l: Undercurrents. See S 1545.

Wednesdays

- 1300 Radio For Peace Int'l: Second Opinion. See W 0500.
 1308 Swiss Radio Int'l: Dateline. See S 0208.
 1313 Radio Australia: Sports Report. See S 1313.
 1330 Radio Australia: Just Out. See M 0030.
 1330 Radio Finland: Northern Report. See T 0230.
 1330 Radio For Peace Int'l: Along The Color Line. See W 0530.
 1338 Swiss Radio Int'l: Dateline. See S 0208.
 1340 Radio Finland: Press Review. See M 1240.
 1345 Radio Finland: Sports Fare. See W 0245.
 1345 Radio For Peace Int'l: Undercurrents. See S 1545.

Thursdays

- 1300 Radio For Peace Int'l: The Practice Of Peacemaking. See S 0600.
 1308 Swiss Radio Int'l: Dateline. See S 0208.
 1313 Radio Australia: Sports Report. See S 1313.
 1330 Radio Australia: Music Of Radio Australia. See S 1113.
 1330 Radio Finland: Northern Report. See T 0230.
 1330 Radio For Peace Int'l: United Nations. See M 2330.
 1338 Swiss Radio Int'l: Dateline. See S 0208.
 1340 Radio Finland: Press Review. See M 1240.

- 1345 Radio Finland: Roots In Finland. See H 0245.
 1345 Radio For Peace Int'l: Undercurrents. See S 1545.

Fridays

- 1300 Radio For Peace Int'l: WINGS. See F 0500.
 1308 Swiss Radio Int'l: Dateline. See S 0208.
 1313 Radio Australia: Sports Report. See S 1313.
 1330 Radio Australia: Music Of Radio Australia. See S 1113.
 1330 Radio Finland: Northern Report. See T 0230.
 1330 Radio For Peace Int'l: The Neumaier Report. See F 0530.
 1338 Swiss Radio Int'l: Dateline. See S 0208.
 1340 Radio Finland: Press Review. See M 1240.
 1345 Radio Finland: Names In The News. See F 0245.
 1345 Radio For Peace Int'l: Undercurrents. See S 1545.

Saturdays

- 1300 Radio For Peace Int'l: UNESCO. See T 0330.
 1308 Swiss Radio Int'l: Dateline. See S 0208.
 1313 Radio Australia: Sports Report. See S 1313.
 1318 Swiss Radio Int'l: Swiss Shortwave Merry-Go-Round. See S 0218.
 1330 Radio Australia: Music Of Radio Australia. See S 1113.
 1330 Radio For Peace Int'l: United Nations. See M 2330.
 1338 Swiss Radio Int'l: Dateline. See S 0208.
 1345 Radio For Peace Int'l: Undercurrents. See S 1545.
 1348 Swiss Radio Int'l: Swiss Shortwave Merry-Go-Round. See S 0218.

1400 UTC

[9:00 AM EST/6:00 AM PST]

FREQUENCIES

1400-1500	All India Radio, Delhi	9565as	11760as	15335as	1400-1500 sa	Radio Tanzania	5985af	9684af	11765af
1400-1430	BBC London	5975eu	6045eu	6180eu	6190af	RCI Montreal	11955am		
		6195as	9410eu	9660eu	9740as	RTM Kuching, Malaysia	4950do		
		9750eu	9760eu	11750as	11820as	RTM Malaysia	7295do		
		11940af	12095eu	15070eu	15310as	SBC Radio 1, Singapore	5010do	5052do	11940do
		15575me	17640va	17705eu	17790af	SLBS, Sierra Leone	3316do	5980do	
		7180as	17880af	21470af	21660af	Sri Lanka B'casting Corp.	6075as	9720as	
						Vatican Radio	9600au	15090au	17525au
1400-1500	BBS Bahrain	6010me				VLW6 Wanneroo, Australia	6140		
1400-1425	BRT Brussels	21810na				VOA	6110as	9760as	15160au
1400-1500	Cameroon Radio-TV	4850na				VOA	6110as	7125as	9645as
1400-1500	CFCX Montreal	6005do					15395as		
1400-1500	CFRX Toronto	6070do					15205me		
1400-1500	CSM World Svc, Boston	9530pa	13625pa	13760pa			4935do		
		21670pa					7255af		
1400-1500	FEBC Manila	11995as					9465na	15105na	
1400-1500	FEBC Manila	11685pa					15420na		
1400-1500	HCJB Quito	11925na	15115na	17890na	21455na		12160na	15690am	
1400-1500 a	IRRS Milan, Italy	7125eu					9705am	11550as	11830am
1400-1500	King of Hope, Lebanon	6280me					5023do		17760am
1400-1500	KTBN Salt Lake City	7510ww					3230do	5005do	7165do
1400-1410	Malawi B'casting Corp.	3381do					5975eu	6045eu	6180eu
1400-1500	R. for Peace Int'l	15030am	21465am				6195as	9410eu	9750eu
1400-1500	Radio 1, Accra, Ghana	4915do					9760eu	11750as	11820as
1400-1500	Radio 2, Accra, Ghana	7295do					12095eu	15070va	15310as
1400-1500	Radio Australia	5995va	6080va	7240va	9580va		17640va	17705eu	17790af
		9710va	9770va	9860va	11720va		7180as	21470af	21660af
		12000va	13755va				3260do	7275do	
1400-1500	Radio Beijing	7405am					11587am	11605na	15640na
1400-1500	Radio Beijing	11815as	15165as				17590eu		17575eu
1400-1430	Radio Douala, Cameroon	4795do							
1400-1430 as	Radio Finland	15400na	21550na						
1400-1500	Radio France Int'l	7125as	11910as	17650as	21770as				
1400-1500	Radio Japan	9505am	9535am	11815as					
1400-1500	Radio Jordan	9560me							
1400-1410	Radio Juba, Sudan	9540do	9550do						
1400-1500	Radio Korea	9570as							
1400-1500	See Radio Moscow World Svc	1300ut							
1400-1500	Radio Nigeria	4990do	7285do						

SELECTED PROGRAMS

Sundays

- 1400 Radio Finland: Perspectives. See S 0230.
 1400 Radio For Peace Int'l: The Practice of Peacemaking. See S 0600.
 1401 BBC: Feature. Trace the relationship between "Japan And The West" (through 16th) before embarking on another series of the phone-in "It's Your World" — just dial London 71-379-7444 (through March 29th).
 1415 Radio Finland: Forum Helsinki. Program details not available at press time.
 1430 BBC: Anything Goes. Bob Holness presents a variety of music and other recordings.
 1430 Radio Australia: Communicator. The latest developments in the media and communications world.
 1430 Radio For Peace Int'l: Consider The Alternatives. See S 0630.

Mondays

- 1405 BBC: Outlook. Conversation, controversy, and color from the UK and the world.
 1425 Radio Australia: Stock Exchange Report. Financial news from Sydney and other exchanges.
 1430 BBC: Off The Shelf. See M 0430.
 1430 Radio Australia: Music Of Radio Australia. See S 1113.
 1430 Radio Finland: Business Monday. See M 0230.
 1430 Radio For Peace Int'l: World Of Radio. See S 0230.
 1440 Radio Finland: Press Review. See M 1240.
 1445 BBC: Talks. See S 0445.
 1445 Radio Australia: Word Of Mouth. Oral histories of Australians.
 1445 Radio Finland: Airmail. See M 0240.
 1450 Radio Finland: Close-Up. Program details not available at press time.

Tuesdays

- 1400 Radio For Peace Int'l: New Dimensions Radio. See M 0400.
 1405 BBC: Outlook. See M 1405.
 1425 Radio Australia: Stock Exchange Report. See M 1425.
 1430 BBC: Off The Shelf. See M 0430.
 1430 Radio Australia: Lane's Company. Terry Lane talks with people from all walks of life.
 1430 Radio Finland: Northern Report. See T 0230.
 1440 Radio Finland: Press Review. See M 1240.
 1445 BBC: Classical Music. See M 0145.
 1445 Radio Finland: Highlights. See T 0245.
 1450 Radio Finland: Close-Up. See M 1450.

Wednesdays

- 1400 Radio For Peace Int'l: World Citizen's Hour. See W 0600.
 1405 BBC: Outlook. See M 1405.
 1425 Radio Australia: Stock Exchange Report. See M 1425.
 1430 BBC: Off The Shelf. See M 0430.
 1430 Radio Australia: Innovations. Desley Blanch reports on inventions and innovative practices.
 1430 Radio Finland: Northern Report. See T 0230.
 1440 Radio Finland: Press Review. See M 1240.
 1445 BBC: Good Books. Recommendations of books to read.
 1445 Radio Finland: Sports Fare. See W 0245.
 1450 Radio Finland: Close-Up. See M 1450.

Thursdays

- 1400 Radio For Peace Int'l: Sound Currents Of The Earth. See M 0230.
 1405 BBC: Outlook. See M 1405.
 1425 Radio Australia: Stock Exchange Report. See M 1425.
 1430 BBC: Off The Shelf. See M 0430.
 1430 Radio Australia: Monitor. A look at the impact of science and technology on society.

- 1430 Radio Finland: Northern Report. See T 0230.
 1440 Radio Finland: Press Review. See M 1240.
 1445 BBC: Recording Of The Week. See M 0545.
 1445 Radio Finland: Roots In Finland. See H 0245.
 1450 Radio Finland: Close-Up. See M 1450.
Fridays
 1400 Radio For Peace Int'l: The Wisdom Of Joseph Campbell. See S 0200.
 1405 BBC: Outlook. See M 1405.
 1425 Radio Australia: Stock Exchange Report. See M 1425.
 1430 BBC: Off The Shelf. See M 0430.
 1430 Radio Australia: Science File. See W 1130.
 1430 Radio Finland: Northern Report. See T 0230.
 1430 Radio For Peace Int'l: Food For The Thoughtful. See M 0330.
 1440 Radio Finland: Press Review. See M 1240.
 1445 BBC: Global Concerns. See F 0145.
 1445 Radio Finland: Names In The News. See F 0245.
 1450 Radio Finland: Close-Up. See M 1450.
Saturdays
 1400 Radio Finland: Northern Report. See T 0230.
 1400 Radio For Peace Int'l: Common Ground. See A 0600.
 1401 BBC: John Peel. See T 0330.
 1410 Radio Finland: Finnish History. See A 0245.
 1415 Radio Finland: Airmail. See M 0240.
 1430 BBC: Sportsworld. Shortwave's "Wide World Of Sports," with the latest soccer, cricket, tennis, golf, and more.
 1430 Radio Australia: Interaction. See S 0530.
 1430 Radio Finland: Names In The News. See F 0245.
 1430 Radio For Peace Int'l: Second Opinion. See W 0500.
 1435 Radio Finland: Roots In Finland. See H 0245.
 1440 Radio Finland: Starting Finnish. See S 0240.
 1445 Radio Finland: Highlights. See T 0245.
 1450 Radio Finland: Close-Up. See M 1450.

1500 UTC

[10:00 AM EST/7:00 AM PST]

FREQUENCIES

1500-1530	BBC London	3915as	5975eu	6045eu	6180eu	6190af	1500-1600	Radio Nigeria	4990do	7285do			
	6195eu	6195as	9410eu	9740na	9750eu	9760eu	1500-1530 as	Radio Norway	11870na				
	11750as	11775na	11940af	12095eu	15070va	15310as	1500-1550	Radio Pyongyang	9325va	9640va	9977va	11705va	
	15400af	15420af	15575me	7180as	15260na	17640va	1500-1530	Radio Romania Int'l	11775as	11940as	15250as	15335as	
	17705eu	17790af	17860af	17880af	21470af				17720as	17745as			
	21490af	21660af					1500-1600	Radio RSA, Johannesburg	7230af	11880af			
1500-1600	BBS Bahrain		6010me				1500-1530 sa	Radio Tanzania	5985af	9684af	11765af		
1500-1600	Cameroon Radio-TV		4850do				1500-1530	RCI Montreal	9555eu	11915eu	11935e	u 13650eu	
1500-1600	CFCX Montreal		6005do						15315eu	15325eu	17820eu	21545eu	
1500-1600	CFRX Toronto		6070do				1500-1600 s	RCI Montreal	11955am				
1500-1600	CSM World Svc, Boston		9530pa	13625pa	13760pa		1500-1600	RTM Malaysia	7295do				
			21670pa				1500-1600	SBC Radio 1, Singapore	5010do	5052do	11940do		
1500-1550	Deutsche Welle		9735af	11965af	13610af	15145af	1500-1600	SLBS, Sierra Leone	3316do	5980do			
			17735af	17765af			1500-1600	Sri Lanka B'casting Corp.	6075as	9720as			
1500-1555	FEBA Seychelles		11865af				1500-1600	Ulaanbaatar R., Mongolia	7260as	13780as			
1500-1600 twhta	FEBA Seychelles		9810as	15330af			1500-1600	VOA	6110as	7125as	9645as	9760as	
1500-1600	FEBC Manila		11995as						15395as				
1500-1600	HCJB Quito		11925na	15115na	17890na	21455na	1500-1600	VOA	9700eu	15205me			
1500-1600 a	IRRS Milan, Italy		7125eu				1500-1600	Voice of Ethiopia	7165af				
1500-1600	KNLS Anchor Point, Alaska		9615as				1500-1600 mtwhf	Voice of Kenya	4935do				
1500-1600	KTBN Salt Lake City		15590na				1500-1600	Voice of Myanmar	5990do				
1500-1600	KTWR Guam		11650as				1500-1600	Voice of Nigeria	7255af				
1500-1600	R. for Peace Int'l		15030am	21465am			1500-1600	WHRI Noblesville	15105na	21840sa			
1500-1600	Radio 1, Accra, Ghana		4915do				1500-1600	WRNO New Orleans	15420na				
1500-1600	Radio 2, Accra, Ghana		7295do				1500-1600	WWCR Nashville	15690am	17525am			
1500-1600	Radio Australia		5995va	6080va	7240va	9580va	1500-1600	WYFR	11830am	15215am	17760am		
	9710va	9770va	9860va	11720va	12000va	13755va	1505-1530	Radio Finland	6120eu	9730af	11755eu	15440me	
1500-1600	Radio Bangladesh		4880do						21550eu				
1500-1600	Radio Beijing		7405am				1522-1535	Voice of Taiwan	9910as				
1500-1600	Radio Beijing		11815as	15165as			1523-1530	R. Veritas Asia, Manila	15140as				
1500-1600	Radio Japan		9505am				1530-1600	BBC London	6190af	6195eu	6195as	7180as	
1500-1600	Radio Jordan		9560na						9410eu	9740na	9750eu	11750as	11775na
1500-1600	Radio Moscow World Svc		4810do	5905eu	5960eu	6055eu			12095eu	15070va	15260as	15310as	15400af
	7135eu	7170as	7195as	7245as	7260as	7315as			17705eu	17880af	21470af	21660af	17640va
	7330eu	7345as	7380as	7420as	9675eu	9705eu	1530-1600	Radio Sweden	17870na	21500na			
	9725eu	9735as	9755eu	9760as	9795as	9855as	1530-1600	Radio Tanzania	5985af	9684af	11765af		
	9895eu	11655as	11705me	11765me	11780as	11830as	1530-1600	Radio Tirana	9730af	11835af			
	11840am	12025me	12035me	13705as	15345as	15395am	1530-1600	Radio Zambia Int'l	9505af	11880af	17895af		
	15420am	15450as	15465as	15480as	15520as	15535as	1530-1600	RAI Vienna	6155eu	11780as	13730eu	21490va	
	17605as	17610am	17655am	17665am	17670as	17690as	1530-1600	Sudan Nat'l B'casting Cor	9540do	9550do	11635do		
	17790as	17810am	17870as	21615au			1530-1600	Swiss Radio Int'l	13685af	15430af	17830af	21630af	
1500-1525	Radio Netherlands		5955eu	13770eu	15150eu	17575ee	1530-1540 mtwhfa	Voice of Greece	11645eu	15550na	17525na		
			17605eu				1545-1600	Radio Korea World News	7275va				
							1545-1600	Vatican Radio	15090au	17865au			

SELECTED PROGRAMS

Sundays

- 1500 Radio For Peace Int'l: Living Enrichment Center. Life experiences and opportunities from a spiritual perspective.
 1510 Radio Finland: Perspectives. See S 0230.
 1513 Radio Australia: Music Of Radio Australia. See S 1113.
 1515 BBC: International Recital. Live classical music concerts from the BBC Concert Hall (through March 8th).
 1520 Radio Finland: Starting Finnish. See S 0240.
 1530 Radio Australia: Connections. Trevor Robertson presents education issues of the Asian/Pacific region.
 1530 Radio For Peace Int'l: The World In Review. News from the United Nations and worldwide from the week just past.
 1538 Swiss Radio Int'l: Feature. See S 0638.
 1545 Radio For Peace Int'l: Undercurrents. An investigative look at U policy at home and abroad.

Mondays

- 1500 Radio For Peace Int'l: Changemakers. See S 2300.
 1510 Radio Finland: Business Monday. See M 0230.
 1513 Radio Australia: Pacific Sunrise. Business and export development in the Pacific basin.
 1515 BBC: Feature/Drama. See M 0101.
 1520 Radio Finland: Press Review. See M 1240.
 1525 Radio Finland: Airmail. See M 0240.
 1530 Radio Australia: Points Of Law. Geraldine Coutts reports on law and society in Oceania.
 1530 Radio For Peace Int'l: The World In Review. See S 1530.
 1538 Swiss Radio Int'l: Dateline. See S 0208.

- 1545 Radio For Peace Int'l: Undercurrents. See S 1545.

Tuesdays

- 1500 Radio For Peace Int'l: Peace Talks. See M 2300.
 1510 Radio Finland: Northern Report. See T 0230.
 1513 Radio Australia: Music Of Radio Australia. See S 1113.
 1515 BBC: A Jolly Good Show. Dave Lee Travis presents listener rock music requests.
 1520 Radio Finland: Press Review. See M 1240.
 1525 Radio Finland: Highlights. See T 0245.
 1530 Radio Australia: AgriNews. News about agriculture of the Asian/Pacific region, with Denis Gibbons.
 1530 Radio For Peace Int'l: United Nations. See M 2330.
 1538 Swiss Radio Int'l: Dateline. See S 0208.

Wednesdays

- 1510 Radio Finland: Northern Report. See T 0230.
 1513 Radio Australia: Music Of Radio Australia. See S 1113.
 1515 BBC: Talks. See M 2315.
 1520 Radio Finland: Press Review. See M 1240.
 1525 Radio Finland: Sports Fare. See W 0245.
 1530 BBC: Comedy/Drama. A deserted funeral is the subject of the drama "Well, At Least It Didn't Rain" (5th), a new restaurant in "Sauce" (12th); "Frank Muir Goes Into..." comic themes (19th, through April 22nd); hear a humorous look back in "Two Cheers For February" (26th).
 1530 Radio Australia: Matters Of Faith. See M 0430.
 1530 Radio For Peace Int'l: Dialogue. See T 2330.
 1538 Swiss Radio Int'l: Dateline. See S 0208.

Thursdays

- 1500 Radio For Peace Int'l: World Peace And Responsibility. See W 2300.

- 1510 Radio Finland: Northern Report. See T 0230.
 1513 Radio Australia: Music Of Radio Australia. See S 1113.
 1515 BBC: Music With Matthew. See S 2315.
 1520 Radio Finland: Press Review. See M 1240.
 1525 Radio Finland: Roots In Finland. See H 0245.
 1530 Radio Australia: Business Horizons. See T 1130.
 1530 Radio For Peace Int'l: United Nations. See M 2330.
 1538 Swiss Radio Int'l: Dateline. See S 0208.

Fridays

- 1500 Radio For Peace Int'l: World Citizens Assembly. See H 2300.
 1510 Radio Finland: Northern Report. See T 0230.
 1513 Radio Australia: Music Of Radio Australia. See S 1113.
 1515 BBC: Music Review. See H 2315.
 1520 Radio Finland: Press Review. See M 1240.
 1525 Radio Finland: Names In The News. See F 0245.
 1530 Radio For Peace Int'l: Population Update or FAO. See H 2330.
 1538 Swiss Radio Int'l: Dateline. See S 0208.

Saturdays

- 1510 Radio Finland: Northern Report. See T 0230.
 1513 Radio Australia: Music Of Radio Australia. See S 1113.
 1515 BBC: Sportsworld. See A 1430.
 1520 Radio Finland: Finnish History. See A 0245.
 1530 Radio Australia: One World. See S 1130.
 1538 Swiss Radio Int'l: Dateline. See S 0208.
 1548 Swiss Radio Int'l: Swiss Shortwave Merry-Go-Round. See S 0218.

1600 UTC

[11:00 AM EST/8:00 AM PST]

FREQUENCIES

1600-1630	BBC London	1540af	3915as	5975as	6190af	1600-1630	Radio Polonia, Warsaw	6135eu	9540eu		
		6195eu	9410eu	9630af	9740me	1600-1700	Radio RSA, Johannesburg	7230af	11880af	15160af	
		9750eu	11750as	11775na	11940af	1600-1700	Radio Tanzania	5985af	9684af	11765af	
		12095eu	15070eu	15400af	17640va	1600-1700	Radio Zambia Int'l	9505af	11880af	17895af	
		17695eu	17705eu	17860af	17880af	1600-1700 s	RCI Montreal	11955am			
		7180as	15260na	15310as	21470af	1600-1605	SBC Radio 1, Singapore	5010do	5052do	11940do	
		21660af				1600-1700	SLBS, Sierra Leone	3316do	5980do		
1600-1700	BBS Bahrain	6010me				1600-1700	Sri Lanka B'casting Corp.	6075as	9720as		
1600-1700	BSKSA Saudi Arabia	9705eu	9720eu			1600-1700	TWR Swaziland	9600af			
1600-1700	CFCX Montreal	6005do				1600-1640	UAE Radio, Dubai	11795af	13675eu	15320eu	15400af
1600-1700	CFRX Toronto	6070do						21605eu			
1600-1700	CSM World Svc, Boston	11580as	13625as	21640af		1600-1615	Vatican Radio	15090au	17865au		
1600-1650	Deutsche Welle	6170as	7225as	7305as	9615as	1600-1630	VOA	9700eu	15205me		
		11785as	15105as	15415as	15595	1600-1700	VOA	6110as	7125as	9645as	9760as
								15395as			
1600-1615 a	FEBA Seychelles	11865as				1600-1700	VOA	9575af	11920af	15410af	15580af
1600-1630	HCJB Quito	11925am	15115am	17890am	21455am			17800af	21625af		
1600-1630 a	IRRS Milan, Italy	7125eu				1600-1700 mtwhf	Voice of Kenya	4935do			
1600-1700	KSDA Guam	13720as				1600-1700	Voice of Nigeria	7255af			
1600-1700	KTBN Salt Lake City	15590am				1600-1700	Voice of the Somali People	6320do			
1600-1635	KTWR Guam	11650as				1600-1630	Voice of Vietnam	9840eu	12020eu	15010eu	
1600-1610	Malawi B'casting Corp.	3381do				1600-1700	WHRI Noblesville	15105am	17830am		
1600-1700	R. for Peace, Int'l	15030na	21465na			1600-1700	WRNO New Orleans	15420			
1600-1700	Radio 1, Accra, Ghana	4915do				1600-1700	WWCR Nashville	15690am			
1600-1700	Radio 2, Accra, Ghana	7295do				1600-1700	WYFR	11830am	15215am	15355am	17760am
1600-1700	Radio Australia	5995va	6060va	6080va	7240va			21525eu	21615af		
		9580va	9860va	11910va	12000va	1610-1615 mtwhf	Radio Botswana	5955af	7255af		
		13605va	13755va			1615-1700	Swiss Radio Int'l	9885eu			
1600-1700	Radio Beijing	11575af	15130af	15170af		1630-1700	BBC London	3915as	5975as	6190af	6196eu
1600-1700	Radio France Int'l	6175eu 1	1705af	12015af	15530me			9410eu	9630af	9740me	11750as
		17620af	17795af	17850af				11775na	11940af	12095eu	15070eu
1600-1700	Radio Korea	5975om	9870af					15260na	15310as	15400af	15420af
1600-1610	Radio Lesotho	4800do						17640va	17695eu	17860af	17880af
1600-1700	Radio Moscow World Svc	6055eu	7170eu	7220eu	7260eu	1630-1700	HCJB Quito, Ecuador	21470af	21660af		
		7290eu	7315eu	7345eu	7390eu	1630-1700	Radio Cairo	15270eu	21455eu	21480eu	
		9575eu	9725eu	9755as	9795as			15255af			
		9885as	9895eu	11705me	11725am	1630-1700 mtwhf	Radio Netherlands	6020af	15570af		
		11840am	12035me	13705as	15395as	1630-1657	RCI Montreal	7150as	9555as		
		15420am	15450as	15465as	15480as	1630-1700 mtwhf	RTV Morocco	15335af	15360af	17595af	
		15485as	17605as	17610am	17655as	1630-1700	RTV Rwandiasse	3330	6055		
		17670as	17690am	17775as	17780as	1630-1700	VOA	6180eu	9700eu	9760me	11710me
		17810am	17870as	21615as	21785au			15205me	15245me		
1600-1700	Radio Nigeria	4990do									
1600-1630 as	Radio Norway	15230me	21730me								
1600-1630	Radio Pakistan	11570me	13665me	15560me	17555af						
		17725af	21480me								

SELECTED PROGRAMS

Sundays

- 1615 BBC: Feature. See S 0230.
 1630 Radio Australia: Music Of Radio Australia. See S 1113.
 1645 BBC: Letter From America. See S 0615.
 1645 Radio Australia: Sports Report. See S 1313.

Mondays

- 1615 BBC: New Ideas. Innovative developments in technology and new products.
 1630 Radio Australia: Music Of Radio Australia. See S 1113.
 1635 BBC: Talks. Nick Rankin looks at trees, trees, and more "Trees" (through April 6th).
 1645 BBC: The World Today. A look at a topical aspect of the international scene.

- 1645 Radio Australia: Sports Report. See S 1313.

Tuesdays

- 1615 BBC: Megamix. See T 1130.
 1630 Radio Australia: Music Of Radio Australia. See S 1113.
 1645 BBC: The World Today. See M 1645.
 1645 Radio Australia: Sports Report. See S 1313.

Wednesdays

- 1615 BBC: Rock/Pop Music. See T 0630.
 1630 Radio Australia: Music Of Radio Australia. See S 1113.

- 1645 BBC: The World Today. See M 1645.

- 1645 Radio Australia: Sports Report. See S 1313.

Thursdays

- 1615 BBC: Network UK. Issues and events affecting people across the UK.

- 1630 Radio Australia: Music Of Radio Australia. See S 1113.

- 1645 BBC: The World Today. See M 1645.

- 1645 Radio Australia: Sports Report. See S 1313.

Fridays

- 1615 BBC: Science In Action. The latest news about scientific innovations.

- 1630 Radio Australia: Music Of Radio Australia. See S 1113.

- 1645 BBC: The World Today. See M 1645.

- 1645 Radio Australia: Sports Report. See S 1313.

Saturdays

- 1615 BBC: Sportsworld. See A 1430.

- 1630 Radio Australia: Music Of Radio Australia. See S 1113.

- 1645 Radio Australia: Sports Report. See S 1313.



*Ian Anderson,
host of BBC's
Folk In Britain.*

1700 UTC

[12:00 PM EST/9:00 AM PST]

FREQUENCIES

1700-1730	BBC London	3255af	7160me	15260na	21470af
		21660af			
		3915as	5975as	6005af	6180eu
		6190af	6195eu	9410eu	9630af
		9740eu	11750as	11775na	12095eu
		15070eu	15310as	15400af	15420af
		17640va	17695eu	17860af	17880af
1700-1800	BBS Bahrain	6010me			
1700-1800	BSKSA Saudi Arabia	9705eu	9720eu		
1700-1800	CFCX Montreal	6005do			
1700-1800	CFRX Toronto	6070do			
1700-1800	CSM World Svc, Boston	11580as	13625as	21640af	
1700-1800	HCJB Quito	21455am	21480am	25950na	
1700-1730	HCJB Quito, Ecuador	15270eu	21455eu	21480eu	
1700-1800	KSDA Guam	13720as			
1700-1800	KTBN Salt Lake City	15590			
1700-1800	R. E. Africa, Eq. Guinea	7190af			
1700-1800	R. for Peace, Int'l	15030na	21465na		
1700-1800	Radio 1, Accra, Ghana	4915do			
1700-1705	Radio 2, Accra, Ghana	7295do			
1700-1800	Radio Australia	5995va	6060va	6080va	7240va
		9580va	9860va	11910va	12000va
		13605va	13755va		
1700-1710	Radio Bafoussam, Cameroon	4000do			
1700-1800	Radio Beijing	7405af	9570af	11575af	
1700-1800	Radio Cairo	15255af			
1700-1800	Radio Japan	7140as	9505am	11815na	15345me
1700-1800	Radio Moscow World Svc	5905eu	6055eu	6175eu	7170eu
		7260eu	7330eu	7345eu	7370eu
		7420eu	9575as	9685eu	9720eu
		9730eu	9755eu	9760as	9795as
		9830as	9895as	11630af	11730af
		11840am	12030af	13670am	15450am
		15485am	17670am		
1700-1725	Radio Netherlands	6020af	15570af		
1700-1800	Radio Nigeria	3326do	4990do		
1700-1730 as	Radio Norway	9655eu			
1700-1800	Radio Pakistan	11570eu	15550eu		
1700-1730 mtwhf	Radio Portugal	15425me			
1700-1750	Radio Pyongyang	9325va	9640va	9977va	11705va
1700-1800	Radio RSA, Johannesburg	7230af	11880af	15160af	
1700-1800	Radio Tanzania	5985af	9684af	11765af	
1700-1800	Radio Zambia Int'l	9505af	11880af	17895af	
1700-1730	RCI Montreal	5995eu	7235eu	13650eu	15325eu
		17820eu	21545eu		
1700-1800 mtwhfa	RTV Morocco	15335af	17595af	17815af	
1700-1728	SLBS, Sierra Leone	3316do	5980do		
1700-1730	Sri Lanka B'casting Corp.	6075as	9720as		
1700-1730	TWR Swaziland	3200af	9520af		
1700-1730	VOA	3980eu	6040me	9700eu	9760me
		15205me			
1700-1730	VOA	9575af	11920af	15410af	15580af
		17800af	21625af		
1700-1800	VOA	6110as	7125as	9645as	15395as
1700-1800 mtwhf	Voice of Kenya	4935do			
1700-1800	Voice of Nigeria	7255af			
1700-1800	WHRI Noblesville	15105	17830		
1700-1800	WMLK Bethel	9465eu			
1700-1800	WRNO New Orleans	15420			
1700-1800	WWCR Nashville	17525			
1700-1800	WYFR	21500va			
1706-1800	Radio 2, Accra, Ghana	3366do			
1715-1745	BBC London	9560ca	21660ca		
1715-1730	Radio Buea, Cameroon	3970do			
1715-1730	Radio Korea World News				
1728-1800	SLBS, Sierra Leone	3316do			
1730-1800	BBC London	3255af	7160me	21470af	21660af
		3915as	5975as	6005af	6180eu
		6190af	6195eu	9410eu	9630af
		9740me	11775na	12095eu	15070eu
		15260na	15310as	15400af	15420af
		17640va	17695eu	17860af	17880af

1730-1745	Radio Bayrak, yprus	6150va			
1730-1745 a	Radio Douala, Cameroon	4795do			
1730-1800	Radio Romania Int'l	11790af	15340af	15365af	17720af
1730-1800	TWR Swaziland	3200af			
1730-1800	Vatican Radio	11625af	15090af	17730af	
1730-1800	VOA	6040eu	9700eu	9760eu	15205eu
1730-1800	VOA	9575af	11920af	15410af	15580af
		17800af	21625af		
1740-1800	Cameroon Radio-TV	4850do			
1745-1800 mtwhfa	Radio Douala, Cameroon	4795do			
1745-1800	RTV Madagascar	3232do	3286do	5005do	

1800 UTC

[1:00 PM EST/10:00 AM PST]

FREQUENCIES

1800-1900	All India Radio, Delhi	11935af			
1800-1830	BBC London	3255af	3955eu	5975as	6180eu
		6190af	6195eu	7160me	7325af
		9410eu	9600af	9740me	11750as
		12095eu	15070eu	15310as	15400af
		17640eu	17880af		
1800-1900	BBS Bahrain	6010me			
1800-1900	BSKSA Saudi Arabia	9705eu	9720eu		
1800-1900	Cameroon Radio-TV	4850do			
1800-1900	CFCX Montreal	6005do			
1800-1900	CFRX Toronto	6070do			
1800-1900	CSM World Svc, Boston	13625as	15665am	21640af	
1800-1830	Georgian Radio, Tbilisi	12070me			
1800-1815	Kol Israel	11587na	11675eu	15590af	17575sa
1800-1900	KTBN Salt Lake City	15590			
1800-1810	Malawi B'casting Corp.	3381do			
1800-1900	R. E. Africa, Eq. Guinea	7190af			
1800-1900	R. for Peace Int'l	13630am	15030am		
1800-1900	Radio 1, Accra, Ghana	4915do			
1800-1900	Radio 2, Accra, Ghana	7295do			
1800-1900	Radio Afghanistan	6145eu	7215eu	9635am	
1800-1900	Radio Australia	5995va	6060va	6080va	7240va
		9580va	9860va	11910va	12000va
		13605va	13755va		
1800-1900	Radio Baghdad, Iraq	11740eu			
1800-1840 w	Radio Bertoua, Cameroon	4750do			
1800-1830	Radio Cairo	15255af			
1800-1845 mtwhfa	Radio Douala, Cameroon	4795do			
1800-1900	Radio Ivory Coast, Abidjn	11920af			
1800-1900	Radio Korea	15575eu			
1800-1900	Radio Moscow World Svc	7170eu	7260eu	7330eu	7345as
		7370as	7420as	9540eu	9575as
		9685am	9720eu	9755af	9765af
		9795af	9830af	9860af	9895eu
		11630af	11840am	13670am	
1800-1900	Radio Mozambique	3265af	4855af	9618af	
1800-1900	Radio New Zealand Int'l	15120pa			
1800-1900	Radio Nigeria	3326do	4990do		
1800-1900	Radio Tanzania	5985af	9684af	11765af	
1800-1900	Radio Zambia Int'l	9505af	11880af	17895af	
1800-1900	Radiobras, Brasilia	15265eu			
1800-1830 mtwhf	RCI Montreal	13670af	15260af	17820af	
1800-1900 as	RCI Montreal	13670me	15260me	17820me	
1800-1830	RTV Congolaise	3265af	4765af		
1800-1900	SLBS, Sierra Leone	3316do			
1800-1845	TWR Swaziland	3200af	9600af		
1800-1900	VOA	6040eu	9700eu	9760me	15205me
1800-1900	VOA	9575af	11920af	15410af	15580af
		17800af	21625af		
1800-1900	Voice of Ethiopia	9662af			
1800-1900 mtwhf	Voice of Kenya	4935do			
1800-1830	Voice of Vietnam	9840eu	12020eu	15010eu	
1800-1900	WHRI Noblesville	13760na	17830sa		
1800-1900	WMLK Bethel	9465eu			
1800-1900	WRNO New Orleans	15420na			
1800-1900	WWCR Nashville	15690na	17525na		
1800-1900	WYFR	21500va			
1815-1900	Radio Bangladesh	12030as	15255as		

1800 UTC continued

FREQUENCIES

1815-1830	Radio Voice of Lebanon	5me	6549.5		
1830-1900	BBC London	3255af	3955eu	6005af	6180eu
		6190af	6195eu	7325eu	9410eu
		9600af	11750as	12095eu	15070eu
		15400af	17880af		
1830-1900 a	Lativan Radio, Riga	5935eu			
1830-1900	Radio Netherlands	6020af	15570af	17605af	21685af
1830-1855	Radio Polonia, Warsaw	5995eu	6135eu	7285eu	9525eu
1830-1900	Radio Sofia, Bulgaria	6035eu	9560eu	9700af	11680eu
		11720af	11735af		
1830-1900	Radio Tirana	7120eu	9480eu		
1830-1900	RAI Vienna	5945eu	6155eu	12010me	13730af
1830-1900	Sri Lanka B'casting Corp.	9720eu	15120eu		
1830-1900	Swiss Radio Int'l	9885af	11955af		
1840-1850 mtwhfa	R National de Venezuela	9540om			
1840-1850 mtwhfa	Voice of Greece	11645af	12105af	15650af	
1845-1900	Ghana B'casting Corp.	6130af			
1845-1900	RTV Guinea	4900af	7125af		
1845-1900 s	RTV Mali	4783do	4835do	5995do	7285do
1845-1900	TWR Swaziland	3200af			

1900 UTC

[2:00 PM EST/11:00 AM PST]

FREQUENCIES

1900-2000	All India Radio, Delhi	11935af			
1900-1930	BBC London	3255af	3955eu	6005af	6180eu
		6190af	6195eu	7160me	7325eu
		9410eu	9600af	9630af	11750pa
		12095eu	15070eu	15400af	17880af
		21660af			
1900-2000	BBS Bahrain	6010me			
1900-1930	BRT Brussels	5910eu	9905eu	15515af	
1900-2000	BSKSA Saudi Arabia	9705eu	9720eu		
1900-1945	Cameroon Radio-TV	4850na			
1900-2000	CFCX Montreal	6005do			
1900-2000	CFRX Toronto	6070do			
1900-2000	CSM World Svc, Boston	13625as	15665am	21640af	
1900-1950	Deutsche Welle	9765af	11765af	11785af	11905af
		13790af	15350af	17810af	
1900-2000	Ghana B'casting Corp.	6130af			
1900-2000	HCJB Quito	15270eu	17790eu	21455eu	21480eu
1900-2000	KTBN Salt Lake City	15590			
1900-2000	KVOH Los Angeles	17775am			
1900-2000	R. E. Africa, Eq. Guinea	7190af			
1900-2000	R. for Peace Int'l	13630am	15030am		
1900-2000	Radio 1, Accra, Ghana	4915do			
1900-2000	Radio 2, Accra, Ghana	7295do			
1900-2000	Radio Algiers	9510me	9535me		
1900-2000	Radio Australia	5995va	6060va	6080va	7240va
		9580va	9860va	11910va	12000va
		13605va	13755va		
1900-2000	Radio Baghdad, Iraq	11740eu			
1900-2000	Radio Beijing	6955af	9440af		
1900-2000	Radio Havana Cuba	17705eu			
1900-1930	Radio Japan	9505am	9640am	9645au	11850af
1900-2000	Radio Moscow World Svc	7260eu	7330eu	9540eu	9630eu
		9685am	9725as	9755af	9765af
		9780am	9795af	9855af	9860eu
		9875am	9895af	11630af	11685eu
		11745af	11840am	12050af	12055af
		6020af	15570af	17605af	21685af
1900-1925	Radio Netherlands	15120pa			
1900-2000 smtwhf	Radio New Zealand Int'l	3326do	4990do		
1900-2000	Radio Nigeria	6035eu	9560eu	9700af	11680eu
1900-2000	Radio Sofia, Bulgaria	11720af	11735af		
1900-1915	Radio Tanzania	5985af	9684af	11765af	
1900-2000	Radio Zambia Int'l	9505af	11880af	17895af	
1900-2000	RAE Buenos Aires	15345eu			
1900-1930 mtwhf	RCI Montreal	13670me	15260me	17820me	
1900-2000 s	RTV Morocco	15335af			
1900-2000	SLBS, Sierra Leone	3316do			

1900-2000	Spanish Foreign Radio	6130as	9675eu	9685af	9875eu
1900-2000	Sri Lanka B'casting Corp.	9720eu	15120eu		
1900-2000	TWR Swaziland	3200af	3240af		
1900-2000	VOA	6040eu	9700eu	9760eu	11710eu
		15205eu			
1900-2000	VOA	9525as	11870as	15180au	
1900-2000	VOA	9575af	11920af	15410af	15580af
		17800af	21625af		
1900-2000 mtwhf	Voice of Kenya	4935do			
1900-2000	Voice of Nigeria	7255af			
1900-1930	Voice of Vietnam	9840eu	12020eu	15010eu	
1900-2000	WHRI Noblesville	13760	17830		
1900-2000	WMLK Bethel	9465eu			
1900-2000	WRNO New Orleans	15420			
1900-2000	WWCR Nashville	15690			
1900-2000	WYFR	15355eu	21615af		
1910-1915	Radio Botswana	3356af			
1920-1930	Radio Buea, Cameroon	3970do			
1920-1930 mtwhfa	Voice of Greece	9395eu	11645eu		
1930-2000	BBC London	3255af	3955eu	6005af	6180eu
		6190af	6195eu	7160me	7325eu
		9410eu	9600af	11750pa	
		12095eu	15070eu	15400af	17880af
1930-2000 tes	KFBS Saipan	9475af			
1930-1940 irr	Radio Burkina Faso	4815af	7230af		
1930-2000	Radio Federal Yugoslavia	6100eu	15140af		
1930-2000	Radio Finland	6120eu	9730af	11755af	
1930-2000	Radio Prague	6055eu	7345eu		
1930-2000	Radio Romania Int'l	5990eu	6105eu	7145eu	7195eu
		9690eu			
1930-2000	Radio Sweden	6065eu	9655eu	15270eu	
1930-2000	Radio Sweden	6065va	9655va	15270va	
1930-2000	VOIRI Teheran	6140eu	9022eu		
1935-1955	RAI, Rome	7275eu	9710eu	11800eu	
1935-1945	RTV Togo	5047af			
1940-2000 smwha	Ulaanbaatar R., Mongolia	11850eu	12015eu		
1945-2000	Radio Korea World News	6135as			
1950-2000	Sudan Nat'l B'casting Cor	9540do	9550do	11635do	



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2000 UTC [3:00 PM EST/12:00 PM PST]

FREQUENCIES

2000-2030	BBC London	3255af	3955eu	5975eu	6005af
		6180eu	6190af	6195eu	7160me
		7180pa	7325eu	9410eu	9600as
		9630af	11750pa	12095eu	15070eu
		15260sa	15340pa	15400af	17880af
2000-2100	BBS Bahrain	6010me			
2000-2100	BSKSA Saudi Arabia	9705eu	9720eu		
2000-2100	CFCX Montreal	6005do			
2000-2100	CFRX Toronto	6070do			
2000-2100	CSM World Svc, Boston	9455as	13625pa	13770am	15665eu
		17555eu			
2000-2100	Georgian Radio, Tbilisi	12015me			
2000-2100 tes	KFBS Saipan	9475af			
2000-2100	King of Hope, Lebanon	6280me			
2000-2030	Kol Israel	7465am	9435am	11587am	11605am
		11675eu	17575af	17630as	
2000-2100	KTBN Salt Lake City	15590			
2000-2100	KVOH Los Angeles	17775am			
2000-2010 w	Malawi B'casting Corp.	3381do			
2000-2100	R. E. Africa, Eq. Guinea	7190af			
2000-2100	R. for Peace Int'l	13630na	15030na		
2000-2100	Radio 1, Accra, Ghana	4915do			
2000-2100	Radio 2 Accra, Ghana	7295do			
2000-2100	Radio Australia	5995va	6060va	6080va	7240va
		9580va	9860va	11910va	11930va
		12000va	13605va	13755va	
2000-2100	Radio Baghdad, Iraq	11740eu			
2000-2100	Radio Beijing	9440af			
2000-2100	Radio Beijing	9920eu	11500eu		
2000-2100	Radio Beijing	11715af	15170af		
2000-2100	Radio Havana Cuba	15135af	17705eu		
2000-2100	Radio Moscow World Svc	7170eu	7330eu	9540eu	9685am
		9710am	9720am	9725af	9765af
		9795eu	9855af	9860am	9875af
		9895eu	11630af	11685af	11840am
		12050af	12055eu	12060me	15425me
2000-2100 smtwhf	Radio New Zealand Int'l	15120pa			
2000-2100	Radio Nigeria	3326do	4990do		
2000-2030 as	Radio Norway	17730af	17730sa		
2000-2055	Radio Polonia, Warsaw	6135eu	7270eu	9525eu	
2000-2030 mtwhf	Radio Portugal	11740eu			
2000-2050	Radio Pyongyang	6576me	9345eu	9640eu	9977af
2000-2030	Radio Romania Int'l	5990eu	6105eu	7145eu	7195eu
		9690eu			
2000-2030	Radio Sweden	6065eu	9655eu	15270eu	
2000-2030	Radio Sweden	6065eu	9655eu	15270eu	
2000-2100 s	Radio Zambia Int'l	9505af	11880af	17895af	
2000-2030	RCI Montreal	5995eu	7235eu	11945eu	13650eu
		15140eu	15325eu	17875eu	
2000-2100	SLBS, Sierra Leone	3316do			
2000-2030	Swiss Radio Int'l	3985eu	6165eu	9535eu	
2000-2100	TWR Swaziland	3200af	3240af		
2000-2010 smwha	Ulaanbaatar R., Mongolia	11850eu	12015eu		
2000-2030	Vatican Radio	9645af	11625af	15090af	
2000-2100	VOA	6040eu	9700eu	9760eu	11710eu
		15205eu			
2000-2100	Voice of Indonesia	7125as	9675as	11752as	11785as
2000-2010 mtwhf	Voice of Kenya	4935do			
2000-2030	Voice of Nigeria	7255af			
2000-2030	VOIRI Teheran	6140eu	9022eu		
2000-2100	WHRI Noblesville	13760af	17830sa		
2000-2100	WRNO New Orleans	15420			
2000-2100	WWCR Nashville	15690	17525		
2000-2100	WYFR	7355eu	15566eu	17750af	21525eu
2005-2100	Radio Damascus	12085na	15095na		
2010-2100 sa	Voice of Kenya	4935do			
2015-2030	V. de la Rev., Benin	4870af	5025af		
2015-2045 sth	V. of the Black Cockerel	9700af			
2025-2045	RAI, Rome	7235me	9575me	11800me	

2030-2100	BBC London	3255af	3955eu	5975ca	6005af
		6180eu	6190af	6195eu	7180pa
		7325eu	9410eu	11750pa	12095eu
		15070eu	15260sa	15340pa	15400af
2030-2100	IRRS Milan, Italy	7125eu			
2030-2100	Radio Cairo	15375af			
2030-2100	Radio Korea	6480eu	7550af	15575eu	
2030-2100	Radio Netherlands	9895af	11660af	13700af	
2030-2100	RCI Montreal	6010eu	7230eu	9650eu	11945eu
		13650eu	15140eu	15325as	17875as
2030-2100	Voice of Vietnam	9840eu	12020eu	15010eu	
2045-2100	All India Radio, Delhi	7412eu	9665eu	9910eu	11620eu
		11715eu	15265eu		
2045-2100	Radio Korea World News	5975as			
2045-2100	Radio Sofia, Bulgaria	9560eu	11680af	11735af	
2050-2100	Vatican Radio	5935eu	7250eu		

2100 UTC [4:00 PM EST/1:00 PM PST]

FREQUENCIES

2100-2130	BBC London	6195as	5975ca	6005af	3255af
		3955eu	6180eu	15340pa	11750pa
		12095eu	15070na	15260sa	15400af
		9590na	9410eu	7325eu	
2100-2106	BBS Bahrain	6010me			
2100-2200	CFCX Montreal	6005do			
2100-2200	CFRX Toronto	6070do			
2100-2200	CSM World Svc, Boston	9455as	13625pa	13770am	9820pa
		15665eu	17555sa		
2100-2150	Deutsche Welle	6185as	9670as	9765as	11785as
		15350as	15350as		
2100-2130	Georgian Radio, Tbilisi	11760eu			
2100-2200	IRRS Milan, Italy	7125eu			
2100-2130	King of Hope, Lebanon	6280me			
2100-2200	KTBN Salt Lake City	15590			
2100-2200	KVOH Los Angeles	17775			
2100-2110	Malawi B'casting Corp.	3381do			
2100-2200	R. E. Africa, Eq. Guinea	7190af			
2100-2200	R. for Peace Int'l	13630na	15030na		
2100-2200	R. Nacional de Angola	3355af	9535af		
2100-2200	Radio 1, Accra, Ghana	4915do			
2100-2200	Radio 2, Accra, Ghana	7295do			
2100-2200	Radio Australia	6060va	11880va	11930va	13605va
		13705va	15320va	21740va	
2100-2200	Radio Baghdad, Iraq	11740eu			
2100-2130	Radio Beijing	11715af	15170af		
2100-2200	Radio Beijing	9920eu	11500eu		
2100-2200	Radio Budapest	6110eu	9835eu	11910eu	
2100-2200	Radio Cairo	15375af			
2100-2105	Radio Damascus	12085na	15095na		
2100-2200	Radio Japan	11815me	11840eu	15430eu	17810as
		17890as			
2100-2130	Radio Korea	6480eu	7550af	15575eu	
2100-2200	Radio Moscow World Svc	5950eu	5960eu	6175eu	7170eu
		7240af	7255af	7330eu	7340af
		7390af	9450eu	9695eu	9710am
		9720am	9725af	9765af	9795af
		9855af	9860eu	98654am	9895eu
		11685eu	11840am	12050me	12055me
		12060as	15425as	21480as	
2100-2125	Radio Netherlands	9895af	11660af	13700af	
2100-2200	Radio New Zealand Int'l	15120pa			
2100-2200	Radio Nigeria	3326do	4990do		
2100-2130 as	Radio Norway	9590eu			
2100-2130 mtwhf	Radio Portugal	17740eu			
2100-2130	Radio Prague	5930eu	6055eu	7345eu	9605eu
2100-2130	Radio Romania Int'l	5990eu	6105eu	7145eu	7195eu
2100-2130	Radio Sofia, Bulgaria	9560eu	11680af	11735af	
2100-2200	Radio Zambia Int'l	9505af	11880af	17895af	
2100-2200	SLBS, Sierra Leone	3316do			
2100-2200	Spanish Foreign Radio	9875eu			
2100-2200	Sri Lanka B'casting Corp.	15120as			
2100-2130	Swiss Radio Int'l	9885af	12035af	13635af	15525af

2100 UTC continued

2100-2115	TWR Swaziland	3240af			
2100-2110	Vatican Radio	5935eu	7250eu		
2100-2200	VOA	6040eu	9700eu	9760me	11710me
		11960me	15205me		
2100-2200	VOA	11870pa	15185pa	17735pa	
2100-2200	VOA	15410af	15580af	17800af	21485af
		21625af			
2100-2200	Voice of Turkey	9445eu			
2100-2200	WHRI Noblesville	13760	17830		
2100-2200	WRNO New Orleans	15420			
2100-2200	WWCR Nashville	15690	17525am		
2100-2200	WYFR	7355eu	15566eu	17750af	21525eu
2110-2200	Radio Damascus	12085na	15095na		
2115-2130 mtwhf	BBC London Caribbean Rpt.	15140ca	17715ca		
2115-2130 s	R. Republik Indonesia	6070do			
2115-2200	Radio Cairo	9900eu			
2130-2200	BBC London	3255af	3955eu	5975ca	6005af
		6180eu	6195as	7325eu	9410eu
		9590na	11750pa	12095eu	15070na
		15260sa	15340pa	15400af	
2130-2200	BBC London Falkland Is Sv	13660sa			
2130-2200	HCJB Quito	17790eu	21455eu	21480eu	
2130-2200 smtwhf	King of Hope, Lebanon	6280me			
2130-2145	Radio Buea, Cameroon	3970do			
2130-2200 mh	Radio Estonia, Tallinn	5925eu	9560eu		
2130-2200	Radio Sweden	6065eu			
2130-2200	RAI Vienna	5945eu	6155eu	9870af	
2130-2200	RCI Montreal	11880af	15150af	17820af	
2140-2150 mtwhfa	R Nacional de Venezuela	9540			
2145-2200	Cameroon Radio-TV	4850na			

2200 UTC

[5:00 PM EST/2:00 PM PST]

FREQUENCIES

2200-2230	All India Radio, Delhi	7412eu	9665eu	9910eu	11620eu
		11715eu	15265eu		
2200-2300	BBC London	5975na	6195as	9410eu	9570pa
		9590na	9915ca	11750sa	11945as
		11955as	12095na	15070na	15260sa
		15340as	15400af	17830as	
2200-2230	BRT Brussels	5910eu	9905eu	15515af	
2200-2215	Cameroon Radio-TV	4850na			
2200-2300	CFCX Montreal	6005do			
2200-2300	CFRX Toronto	6070do			
2200-2300	CSM World Svc, Boston	9465na	13625as	13770af	15405as
		17555af			
2200-2230	Georgian Radio, Tbilisi	11760eu			
2200-2230 s	KGEI San Francisco	15280sa			
2200-2300	KTBN Salt Lake City	15590			
2200-2300 sa	R. E. Africa, Eq. Guinea	7190af			
2200-2300	R. for Peace Int'l	13630ca	15030ca		
2200-2300	Radio 1, Accra, Ghana	4915do			
2200-2300	Radio 2, Accra, Ghana	7295do			
2200-2300	Radio Australia	11880va	11930va	13605va	13705va
		15160va	15320va	15365va	17795va
		21740va			
2200-2210	Radio Bafoussam, Cameroon	4000do			
2200-2300	Radio Baghdad, Iraq	11740eu			
2200-2230	Radio Beijing	3985eu			
2200-2300	Radio Beijing	7170eu	9880eu		
2200-2245	Radio Cairo	9900eu			
2200-2210	Radio Damascus	12085na	15095na		
2200-2245	Radio Federal Yugoslavia	6100eu	9505eu		
2200-2300	Radio Havana Cuba	9710eu			
2200-2300	Radio Kiev	7400eu	9800eu		
2200-2300	Radio Moscow World Svc	5950eu	5960eu	6045am	6055eu
		6175eu	7115am	7150am	7185eu
		7240af	7255af	7295af	7330af
		7340af	9520as	9720am	9725eu
		9755af	9765am	9790eu	9855af

9860af	9870am	9890eu	12050as
12055af	15130as	15425as	17605au
17655au	17665au	17700am	17720am
21480am			
2200-2300	Radio New Zealand Int'l	17770pa	
2200-2300	Radio Nigeria	3326do	4990do
2200-2255	Radio Polonia, Warsaw	5995eu	6135eu
2200-2230	Radio Prague	5930eu	6055eu
2200-2230 a	Radio Republik Indonesia	3385do	4805do
2200-2230	Radio Sweden	6065eu	
2200-2215	Radio Zambia Int'l	9505af	11880af
2200-2225	RAI, Rome	5990as	9710as
2200-2230	RCI Montreal	5995eu	7180eu
2200-2230	RCI Montreal	11705as	
2200-2300	RCI Montreal	9760eu	11945eu
2200-2300 smtwha	RTM Malaysia	7295do	
2200-2218	RTV Congolaise	4765do	5985do
2200-2300	SBC Radio 1, Singapore	5010do	5052do
2200-2300	SLBS, Sierra Leone	3316do	
2200-2300	UAE Radio Abu Dhabi	7215na	9600na
2200-2300	V. of Free China, Taiwan	9852eu	11580eu
2200-2230	VOA	9530eu	11905me
		15445me	17885eu
2200-2300	VOA	7120as	9770as
		15290au	15305au
2200-2300	WHRI Noblesville	13760na	17830sa
2200-2300	WRNO New Orleans	13720na	
2200-2300	WWCR Nashville	15690na	
2200-2300	WYFR	7355eu	21525eu
2230-2300	Kol Israel	7465am	9435am
		11675sa	17575eu
2230-2300	R. Alma Ata, Kazakhstan	11825as	11920as
		15315as	15385as
		17730as	21490as
		3955as	4395as
		5945as	5960as
		6060as	6075as
		7115as	7235as
		7320as	9505as
2230-2300	Radio Finland	6120af	9730eu
2230-2300	Radio Tirana	7215eu	9725eu
2230-2300	Radio Vilnius, Lithuania	9675eu	9710eu
2230-2300 mtwhf	RTV Congolaise	4765do	
2230-2300	Swiss Radio Int'l	6035eu	6190eu
2230-2300	VOA	9530eu	11905me
2240-2250 smtwhf	Voice of Greece	11645au	
2245-2300	Radio Sofia, Bulgaria	9595am	9700na
		11720eu	11950na
2245-2300	Vatican Radio	7305au	9600au
			11830au



VOA's weekend evening host Roland Massa (left) and producer Missy Bailey (right) select music for "In Concert".

2300 UTC

[6:00 PM EST/3:00 PM PST]

FREQUENCIES

2300-0000	AWR Costa Rica	9725ca	11870ca			2300-0000	Radio Sofia, Bulgaria	9595am	9700am	11660eu	11680na
2300-2330	BBC London	5975na	6175na	6195as	7145as	2300-0000	Radio Thailand	4830as	9655as	11905as	
		9410eu	9570pa	9590na	9915sa	2300-0000 as	RCI Montreal	9535sa	11940sa		
		11750sa	11945as	11955as	12095na	2300-2330	RCI Montreal	9535sa	9755na	11730na	11940sa
		15070na	15260sa	15340pa	15400af	2300-0000 smtwha	RTM Malaysia	7295do			
2300-0000	CFCX Montreal	6005na				2300-0000	SBC Radio 1, Singapore	5010do	5052do	11940do	
2300-0000	CFRX Toronto	6070do				2300-0000	SLBS, Sierra Leone	3316do			
2300-0000	CSM World Svc, Boston	9465na	13625as	13770as	15405af	2300-0000	UAE Radio Abu Dhabi	7215na	9600na	11965na	
		17555af				2300-0000	VOA	7120as	9770as	11760au	15185au
2300-0000	KSDA Guam	15610as						15290au	15305as	17735as	17820as
2300-0000	KTBN Salt Lake City	15590na				2300-0000	VOA	9530me	11905me	11960eu	17885me
2300-0000	R. for Peace Int'l	13630na	15030na			2300-0000	Voice of Turkey	7185me	11710eu		
2300-2305	Radio 1, Accra, Ghana	4915do				2300-0000	WHRI Noblesville	9495na	13760sa		
2300-2305	Radio 2, Accra, Ghana	7295do				2300-0000	WRNO New Orleans	7355na			
2300-0000	Radio Australia	11880va	11930va	13605va	15160va	2300-0000	WWCR Nashville	12160na			
		15320va	15365va	17795va	21740va	2315-0000	All India Radio, Delhi	9535as	9910as	11715as	11745as
2300-0000	Radio Baghdad, Iraq	11830am						15110as			
2300-0000	Radio Japan	11735eu	11815am	15195as	15430am	2330-0000	BBC London	5975na	6175na	6195as	7145as
	17810pa							9570pa	9590na	9915sa	11750sa
2300-0000	Radio Moscow World Svc	6045am	7115am	7135as	7150am			11945as	11955as	12095na	15070na
		7185eu	7240af	7255af	7295af			17830as			
		7330eu	9520eu	9530af	9725eu	2330-0000	Radio Sweden	9695ca	11705ca		
		9765am	9790eu	9860af	9870af	2330-0000	Voice of Vietnam	9840as	12020as	15010as	
		12045as	12050eu	12055af	15130as	2335-2345 smtwhfm	Voice of Greece	9425sa	11645sa	12105sa	
		15150as	15425au	17655au	17665au						
		17700am	17720am	17890am	21480am						
		21690as	21790au								
2300-0000	Radio New Zealand Int'l	17770pa									
2300-2330 as	Radio Norway	11925na									
2300-0000	Radio Orion, South Africa	4810af									
2300-2350	Radio Pyongyang	11700na	13650na								

SELECTED PROGRAMS

Sundays

- 2300 Radio For Peace Int'l: Changemakers. Gini Scott with interviews on topical themes.
- 2305 BBC: World Business Review. The previous week's news and upcoming events.
- 2313 Radio Australia: Sports Report. See S 1313.
- 2315 BBC: Music With Matthew. Brian Matthew with classical music selections.
- 2330 Radio Australia: Business Report. A look at the day's business developments.
- 2330 Radio For Peace Int'l: The World In Review. See S 1530.
- 2345 Radio For Peace Int'l: Undercurrents. See S 1545.

Mondays

- 2300 Radio For Peace Int'l: Peace Talks. Brief talks on subjects such as peace education and development and peace.
- 2305 BBC: World Business Report. The latest news from the markets worldwide.
- 2313 Radio Australia: Sports Report. See S 1313.
- 2315 BBC: Talks. "Poems By Post" presents reader requests and plenty more (through March 30th).
- 2330 BBC: Multitrack 1: Top 20. Tim Smith presents the smash singles on the UK pop music charts.
- 2330 Radio Australia: Business Report. See S 2330.
- 2330 Radio For Peace Int'l: United Nations. Current events programming produced by UN Radio.

Tuesdays

- 2305 BBC: World Business Report. See M 2305.
- 2313 Radio Australia: Sports Report. See S 1313.
- 2315 BBC: International Recital. See S 1515.
- 2330 Radio Australia: Business Report. See S 2330.
- 2330 Radio For Peace Int'l: Dialogue. News from the University for Peace in Costa Rica.

Wednesdays

- 2300 Radio For Peace Int'l: World Peace And Responsibility. The underlying human functioning that has caused wars and hunger.
- 2305 BBC: World Business Report. See M 2305.
- 2313 Radio Australia: Sports Report. See S 1313.
- 2315 BBC: From Our Own Correspondent. See S 0330.
- 2330 BBC: Multitrack 2. Graham Bannerman presents new pop records, interviews, news, and contests.
- 2330 Radio Australia: Business Report. See S 2330.
- 2330 Radio For Peace Int'l: United Nations. See M 2330.

Thursdays

- 2300 Radio For Peace Int'l: World Citizens Assembly. One group's efforts to create an attitude of world citizenship.
- 2305 BBC: World Business Report. See M 2305.
- 2313 Radio Australia: Sports Report. See S 1313.

- 2315 BBC: Music Review. News and views from the world of classical music.
- 2330 Radio Australia: Business Report. See S 2330.
- 2330 Radio For Peace Int'l: Population Update or FAO. Population-related issues or reports on food and agricultural production.

Fridays

- 2305 BBC: World Business Report. See M 2305.
- 2313 Radio Australia: Music/Information. See S 0330.
- 2315 BBC: Worldbrief. A roundup of the week's news headlines and developments.
- 2330 BBC: Multitrack 3. News and releases from the British alternative music scene.

Saturdays

- 2300 Radio For Peace Int'l: Living Enrichment Center. See S 1500.
- 2305 BBC: Words Of Faith. See S 0309.
- 2310 BBC: Book Choice. See H 0140.
- 2313 Radio Australia: Back Page. See S 0313.
- 2315 BBC: A Jolly Good Show. See T 1515.
- 2330 Radio Australia: At Your Request. See S 0130.
- 2330 Radio For Peace Int'l: The World In Review. See S 1530.
- 2345 Radio For Peace Int'l: Undercurrents. See S 1545.

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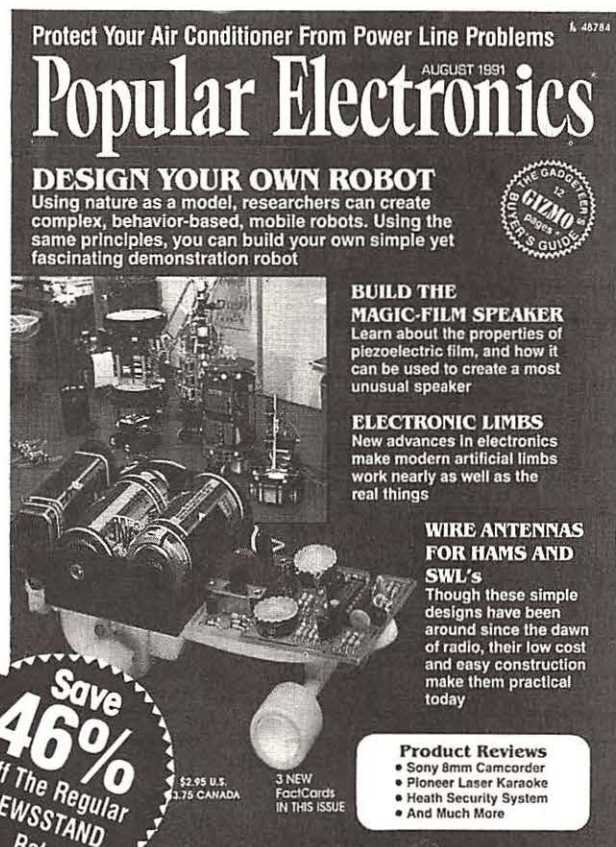
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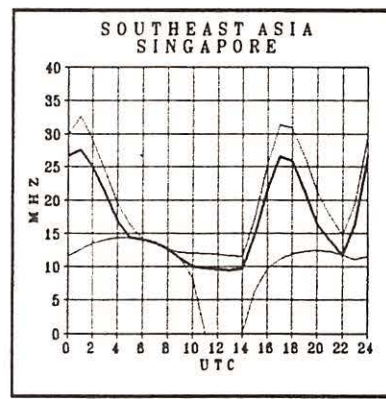
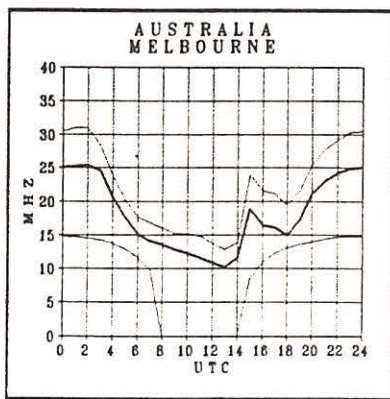
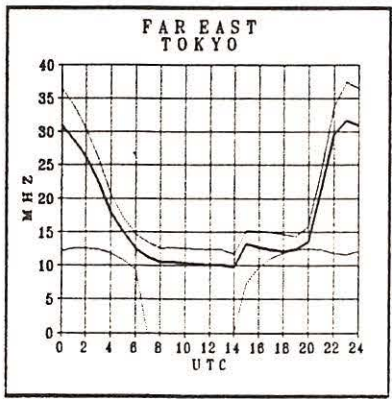
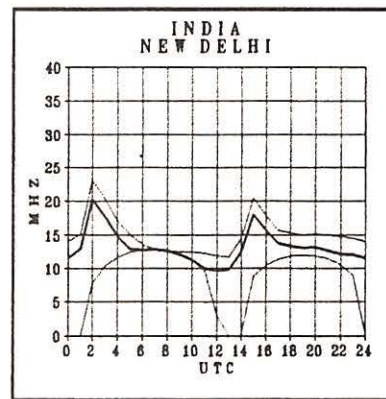
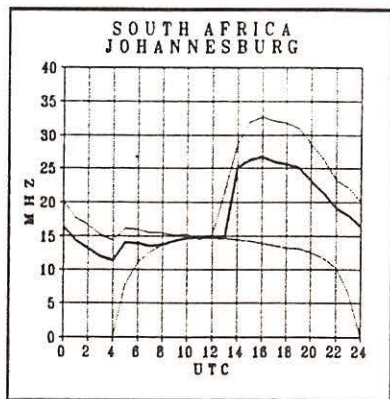
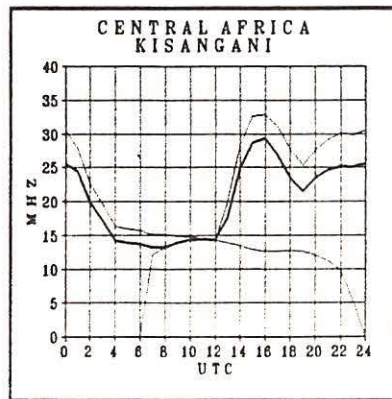
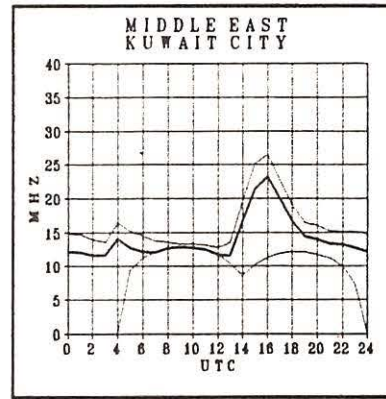
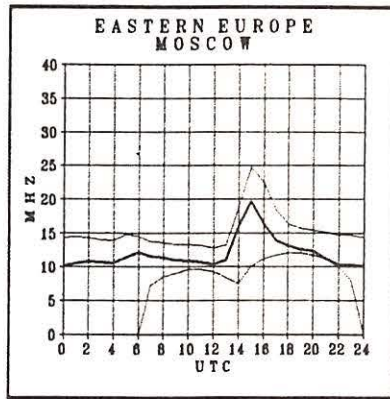
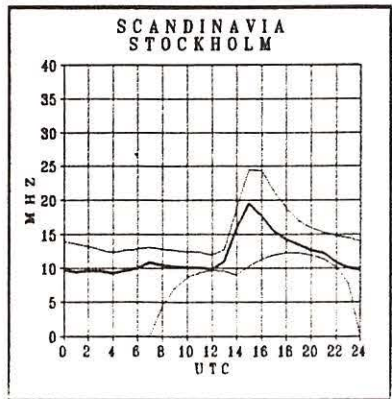
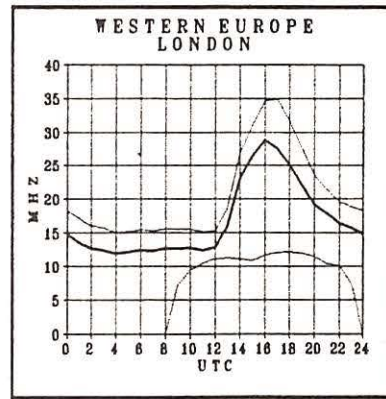
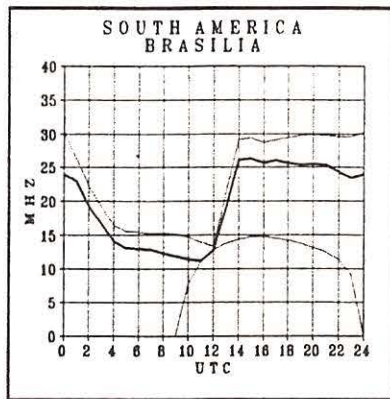
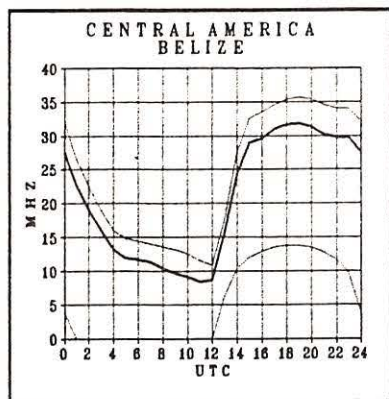
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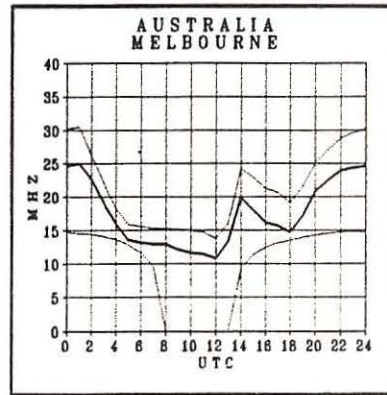
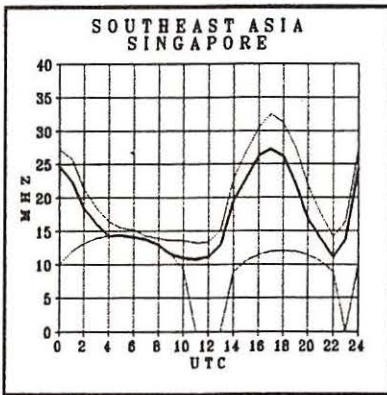
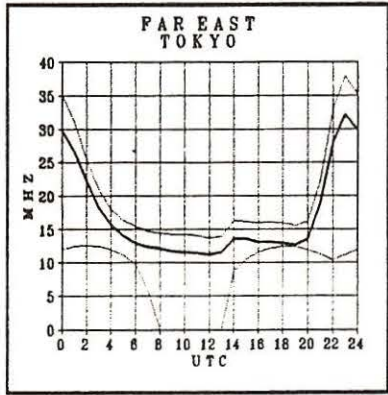
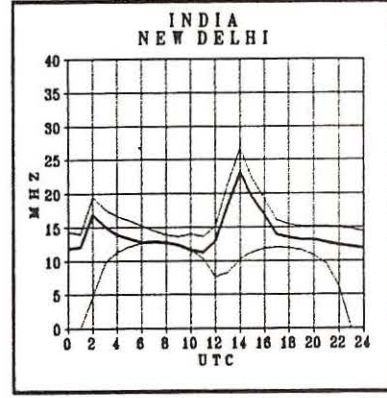
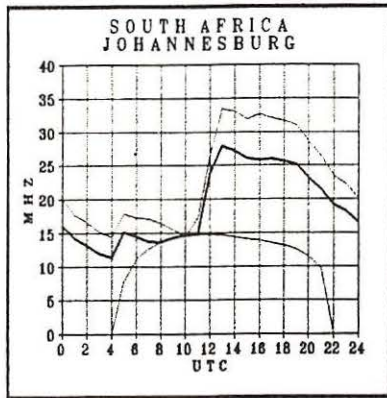
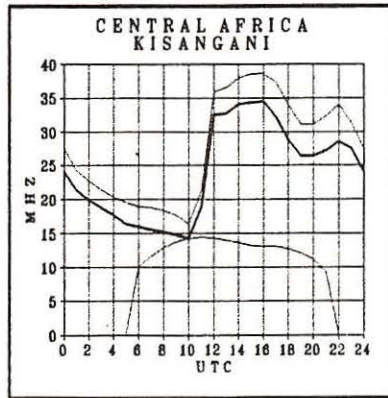
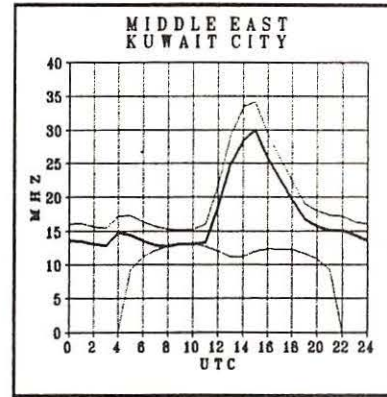
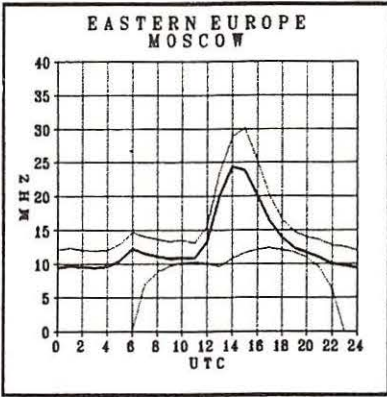
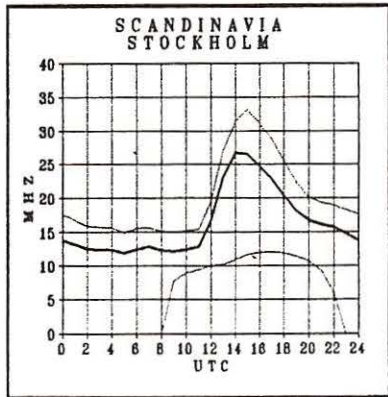
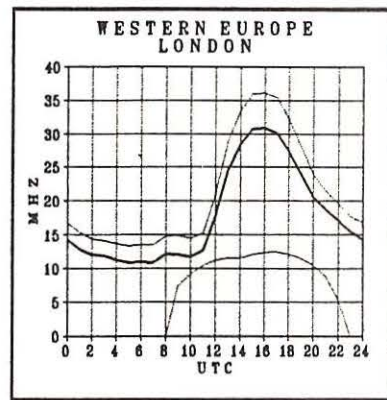
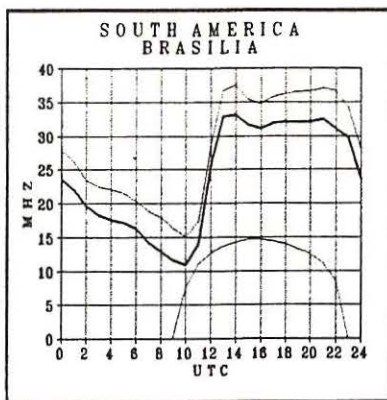
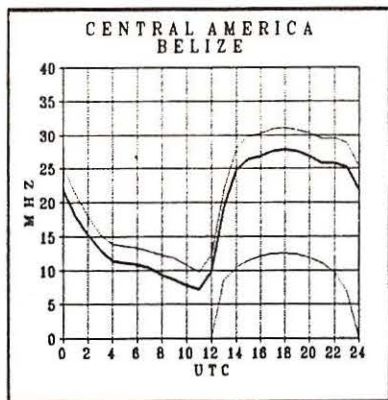
Propagation conditions: Eastern United States

How to use the propagation charts: Propagation charts can be an invaluable aid to the DXer in determining which frequencies are likely to be open at a given time. To use the propagation charts, choose those for your location. Then look for the one most closely describing the geographic location of the station you want to hear.



Propagation Conditions: Western United States

Once you've located the correct charts, look along the horizontal axis of the graph for the time you are listening. The top line of the graph shows the highest, or maximum usable frequency (MUF), the heavy middle line is the frequency for best reception, or optimum working frequency (OWF), and finally, the bottom line is the lowest usable frequency (LUF). The strongest signal will be found along the heavy middle line.



Lowe's Computer-Controlled HF-235 Receiver

Ask nearly any car buff: If money were no object, he'd go for the gold—a Ferrari, for example, or a Bentley. Why not? For all that money, they must be better, right?

Some reckon it's the same with communications receivers. Why buy an ordinary \$1,000 radio when something the pros use can be had? Problem is, of course, the pros have governments and the like supporting their activities. Most of the rest of us don't.

Remote Operation Important for Certain Applications

But even governments have to watch their purses these days, and a surprising number of professional organizations, including the National Security Agency, sometimes use the same consumer-grade shortwave receivers the rest of us do. But not all. The CIA's Foreign Broadcast Information Service (FBIS) uses Watkins-Johnson receivers and remote antenna systems that, taken together, run into the six figures.

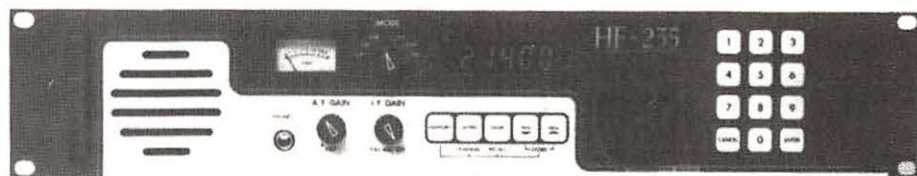
Experienced monitors who work with Watkins-Johnson receivers tell us, frankly, that they'd rather operate a good Japan Radio model if it weren't for the W-J's excellent remote capability.

Why? At the FBIS, monitoring is often done at American embassies abroad. Embassies are lousy places from which to monitor shortwave signals. Yet, if monitoring is done from a remote site there is always the chance personnel will be kidnapped or otherwise subject to mistreatment by anyone with an axe to grind.

By keeping the receiver's tuning and audio systems in embassies, where they can be tuned and listened to, and feeding them by antenna/radio systems located miles away, out in the clear, the Agency both secures its mission and protects its staff.

HF-235 Professional Version of HF-225

England's Lowe Electronics recently brought down the cost of these types of receivers. Its new professional-grade communications receiver, the HF-235, is essentially their consumer-grade HF-225 that has been reworked to meet the requirements of gentlemen with wide-brimmed hats, among others.



Computer Control via RS-232C Interface

Well, sort of... The HF-235/R allows for remote control via computer using an RS-232C serial port. That's not quite the same thing as what the W-J configuration does, but it is familiar turf to a number of *MT* readers who already use computers to operate ordinary receivers having RS-232C ports.

The '235, which is rack-mounted and multi-voltage (110/220V AC), has few controls. There's a mere four knobs, for example, and only five pushbuttons, as compared with the dozens found on some Japanese receivers. There's also an analog signal-strength meter.

Superior Keypad Software

The keypad, unlike that of the '225, is inboard. It's a typical membrane pad, such as is found on the Racal RA6790/GM, and its software is first rate. If you want to hear, say, RCI on 5960 kHz, you just tap in 5-9-6-0, and that's all there is to it. There's no fooling around with "enter" keys, leading zeroes, decimals, or any of the time wasters found on other keypads.

The '235 sounds very good for a professional receiver, even though it lacks the tone control found on the '225. If we look at our lab measurements, we find that distortion is consistently very low. When you hook up a good speaker to this receiver it sounds about as pleasant as shortwave can.

Four Voice Bandwidths for AM and Shortwave

Another thing that helps this set sound so good is that it comes with no less than four voice bandwidths—2.3, 5.6, 9 and 11 kHz. And they

work well, thanks to some innovative engineering on Lowe's part. Of those four bandwidths, the widest is good for listening to AM stations, while the other three cover the varying conditions found on shortwave.

But if you want "bells and whistles," look elsewhere. The '235 doesn't have any notch filter, passband tuning, scanner or adjustable AGC, and the frequency readout is only to the nearest kilohertz. Ironically, the paucity of controls can actually complicate things a bit when you're switching modes and the like.

Nevertheless, the '235, unlike the '225, comes with AGC that can be switched off. Tropical-bands DXers will appreciate this, as they can turn off the AGC during thunderstorms when static tends to trigger the AGC to act, momentarily desensitizing the receiver.

Synchronous Detection Reduces Distortion

The '235 also comes with synchronous detection, like on the Drake R8 and Japan Radio NRD-535. But the '235's doesn't allow individual sidebands to be selected, and so is of limited use except for listening to AM stations during the day or the few shortwave stations that are in the clear. But even with its limitations, the sync detector reduces selective-fading distortion noticeably on some shortwave and mediumwave AM signals.

In the United Kingdom, the basic '235 sells for £950, plus VAT, and fancied up for fax reception and the like it can go to £1,300—that's the equivalent of \$1,700-2,400, which is cheap by professional standards. At present, nobody in the US or Canada carries the '235, but interested parties in any country can write Lowe Electronics at Chesterfield Road, Matlock, Derbyshire DE4 5LE, in England.



DX Radio Tests

The following are "special events" arranged as a DX opportunity for listeners. The first listings were arranged by the Courtesy Program Committee of the National Radio Club. For more information on the NRC and BCB DXing, send \$1 to NRC Membership Center, P.O. Box 118, Poquonock, CT 06064-0118.

KADA-1230, Box 609, Ada, OK 74820, will conduct a DX test on Saturday morning, February 15, 1992, from 0100 to 0130 EST. Programming will consist of march music, Voice and Code IDs. Our thanks to Mr. Roger R. Harris, General Manager, for this test.

KGFW-1340, Box 666, Kearney, NE 68847, will conduct a DX test from 0200 to 0230 AM EST on Monday morning, February 17, 1992. This test will contain Morse Code IDs. Our thanks to Mr. Dirk Christensen Operations Manager for this test.

KUSD-690, Telecommunications Center, Cherry & Dakota Sts., P.O. Box 5000, Vermillion, SD 57069-5000, will conduct a DX test on Monday morning, February 17, 1992, from 0300 to 0330 EST. Program will consist of test signals and programming. Our thanks to Mr. Larry Rohrer of South Dakota Public Radio for this test.

KCRV-1370, P.O. Box 909, Caruthersville, MO 63830, will conduct a rescheduled DX test on February 17, 1992 from 0615 to 0645 EST. This test will consist of tones, voice, and Morse code IDs. NRC CPC caused a mix up on the time and Mr. Cleat Stanfill, GM, has graciously consented to the second test.

KBBS-1450, Buffalo, Wyoming, will conduct a DX test from 0200 to 0400 AM EST on Sunday morning, March 1, 1992. This test will contain music, voice, and Morse code IDs. Our thanks to Mr. Glenn Swiderski. Please direct your reports directly to Glenn at P.O. Box 153, Buffalo, WY 82834.

The following tests were arranged by J.D. Stephens for the International Radio Club of America (IRCA), 11300 Magnolia, #43, Riverside, CA 92505, USA. For a sample issue of DX Monitor, please enclose \$1 or 3 IRCs.

Monday, February 3, 1992: **WLDS-1180**, Jacksonville, Illinois, will conduct a DX test from 2:00 to 2:30 AM EST. The test will include polkas, Morse code IDs, and Voice IDs. Reception reports go to: Mr. Kevin Potter, Chief Engineer, KC9ZK, WLDS-AM, P.O. Box 1180, Jacksonville, IL 62651.

Monday, February 3, 1992: **KHAC-880**, Window Rock, Arizona, will air a special DX test from 3:00 to 4:00 AM EST. The test will include tones, Morse code, voice IDs, and march music. Reception

reports go to: Mr. Bill Hurne, Chief Engineer, KHAC-AM, P.O. Box F, Window Rock, AZ 86515. During the test, KHAC will operate w/10 kW using an omnidirectional antenna pattern.

Monday, February 10, 1992: **KONA-610**, Tri-Cities, Washington, will conduct a DX test from 3:30 to 4:00 AM EST. The test will include Morse code IDs and an unspecified selection of music. Reception reports may be sent to: Mr. Art Blum, Chief Engineer, KONA-AM Radio, P.O. Box 2623, Tri-Cities, WA 99302.

Monday, February 10, 1992: **WVWV-630**, St. Mary's, West Virginia, will run a DX test from 12:00 to 12:30 AM EST. The test will include voice IDs, tones, and "easily identifiable music." Prepaid phone calls will be accepted during the test at (304) 684-3400. Reception reports may be sent to: Mr. Bob Eddy, President/General Manager/Chief Engineer, WVWV-AM, P.O. Box 374, St. Mary's, WV 26170.

Monday, February 10, 1992: **WZZZ-1300**, Fulton, New York, will air a special DX test between 1:15 to 2:00 AM EST. The test will include voice and Morse code IDs and an unspecified selection of music. Reception reports may be sent to: Mr. Peter Hunn, Owner, WZZZ-AM, 1300 Radio Park, Lakeshore Rd., Fulton, NY 13069. Mr. Hunn requests an SASE be included with all reports.

Monday, February 10, 1992: **WAAM-1600**, Ann Arbor, Michigan, will run a DX test between 3:00 and 3:30 AM. The test will include voice and Morse code IDs. Reception reports go to: Mr. Randy Carr, Chief Engineer, N8DBQ, WAAM-AM, 4230 Packard Road, Ann Arbor, MI 48108.

Monday, February 17, 1992: **WILD-1090**, Boston, Massachusetts, will run a special DX test from 2:00 to 3:00 AM EST. The test will include tones, voice, and Morse code IDs. Thanks to Mr. Michael J. Klein, NV1L, of DX Enterprises, P.O. Box 2181, Lynn, MA 01903-2181 for conducting the test. Reception reports go to: WILD DX Test, c/o Personal Database Applications, 2010 Meadow Ridge Rd., Duluth, GA 30136-6037.

Monday, February 17, 1992: **WDAY-970**, Fargo, North Dakota, will run DX test programming between 3:00 and 4:00 AM EST. The test will include Morse code IDs, inserted during station breaks. Reception reports may be sent to: Mr. Marty Berlinger, Chief Engineer, WDAY-AM, 301 8th Street South, Fargo, ND 58103.

Monday, February 24, 1992: **WTMA-1250**, Charleston, South Carolina, will conduct a special DX test from 3:00 to 3:30 AM EST. The test will include Morse code IDs. Reception reports go to: Mr. Bruce Roberts, Chief Engineer, WTMA-AM, P.O. Box 30909, Charleston, SC 29417.

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PASSPORT'S "RDI White Paper" equipment reports contain virtually everything found during IBS' exhaustive tests of premium receivers and antennas. These reports are available in the U.S. from Universal Shortwave, EEB and DX Radio Supply; in Canada from PIF Books by Mail, Box 888, Hawkesbury, Ontario K6A 3E1; in the United Kingdom from Lowe Electronics Limited, Chesterfield Road, Matlock, Derbyshire DE4 5LE, England; and in Japan from IBS-Japan, 5-31-6 Tamanawa, Kamakura 247. For a complete list, please send a self-addressed stamped envelope to RDI White Papers, Box 300M, Penn's Park PA 18943 USA.

Scanner Specs:

What Do All Those Confusing Terms Mean?

It is always bewildering, especially to the newcomer, to make a choice among competitive scanning receivers on the market. But once we understand the meanings of a few basic characteristics, the job becomes much easier.

Crystal or Synthesized?

Always buy a synthesized (keyboard programmable) scanner. Crystal scanners are passe, used only where one or two permanent channels are to be monitored. Buying additional crystals is likely to cost more than a new programmable (crystalless) scanner.

Base, Mobile, or Handheld?

Most base scanners can be used in a vehicle as well; even if there is no mobile mounting bracket provided, there may be a 12 volt jack on the back. A readily-available plug connected to the vehicle's battery supply or to the cigarette lighter is all it takes.

Hand-held scanners usually have all the capabilities of their bigger counterparts, including performance specifications. Their main limitations are compromised sound volume and quality from their teeny speakers, and a need to recharge or replace their batteries if not connected to an external power source.

With the low cost of scanners presently on the market, most listeners who need all three capabilities have separate base, mobile and hand-held radios.

Sensitivity: Some Good News and Some Bad News

The more sensitive a radio is, the better, right? Not always. Extremely sensitive receivers which don't possess wide dynamic range may be overloaded by strong local signals, producing two profound effects, desensitization and intermodulation. Don't panic—we're going to explain all those terms right now!

Desensitization ("desense") is a response intentionally designed into the radio to decrease its sensitivity in the presence of strong signals so that they don't cause distortion. Modern radios, with their wide frequency coverage, often respond to strong signals far from the tuned

frequency, making tuned-in weak signals even weaker.

Most scanners have a sensitivity of about 0.5 microvolts (millionths of a volt); this means that a signal that weak will reduce the background hiss of the radio enough (typically 10-12 decibels) to be heard clearly.

The larger, higher and clearer the antenna, the more signal voltage it can capture and deliver to the radio. This is good for weak signal reception, but bad for strong signal overload—if it doesn't have good dynamic range.

Ideally, a receiver's circuitry should be able to process strong signals just as efficiently as weak signals. The range of signal strengths the receiver can handle without distortion is its dynamic range.

Intermodulation ("intermod") is the production of additional, unwanted signals throughout the radio's range, often interfering with legitimate reception. It is caused by the mixing, usually in the first amplifier stage, of two or more very strong signals.

You can sometimes tell whether a signal you are receiving is an intermod product: If your scanner has an attenuator switch, select that position; if not, change to a poorer antenna. Weak signals will diminish noticeably, but intermod will decrease dramatically. Every 1 dB of signal reduction results in 3 dB intermod reduction.

Some scanners (like the Realistic PRO2006 series) are intentionally designed with less sensitivity (closer to 1 microvolt) to reduce intermod. If you live in a metropolitan area, or have very strong transmitters nearby, you may wish to consider a scanner like this—or a more sensitive scanner with a poor antenna!



Selectivity

The ability of a receiver to discriminate between a desired signal on one frequency and an interfering signal on an adjacent frequency is a measure of its selectivity.

On shortwave, stations are so crowded that sharp selectivity (a few kilohertz) is required to separate them; above 30 MHz, however, frequency allocations are more orderly and stations are separated farther. Scanner manufacturers take advantage of this by using mediocre filters which invite adjacent-channel interference, especially in crowded areas where signals are strong.

Image Response

All modern receivers, by virtue of their traditional superheterodyne design, create additional signals besides those they want to hear. There are ways to reduce or virtually eliminate the unwanted duplicates (images), but it is more expensive, and scanner pricing is quite competitive.

Bearcat owners note that even with cellular frequencies factory-deleted, they can still hear cellular telephones as a form of interference about 21.7 MHz higher in frequency; these are images which actually interfere with legitimate signals on those frequencies.

Scanners which utilize "up-conversion"—raising the frequency before it is lowered for detection—minimize image response.

So Let's Buy a Scanner!

Now how do we use all this new-found information to buy a good scanner? Sadly, few manufacturers provide adequate specifications, and none provides figures on dynamic range or image response. The best you can do is look at the specifications which are available, read reviews and heed the advice of experts.

Monitoring Times and *Popular Communications* have reviewed many scanners. \$2 and a self-addressed, stamped envelope (SASE) will bring a reprint from *MT* if there's one available; call us first (704-837-9200) to be sure.

Buy from a dealer whose expertise you can trust, and who will give you a refund or exchange if your purchase does not meet its expectations.



Build a Simple S Meter

Do you tinker with simple home-made short-wave receivers? If so, chances are that you would like to add an S meter for keeping tabs on propagation conditions from day to day, or to compare the performance of those new antennas you have been trying.

This article provides information on how to construct a low-cost meter circuit that can be added to most regenerative or direct-conversion (DC) receivers. It may be used also with super-heterodyne receivers that do not have an AGC (automatic gain control) circuit.

Types of S meters

The letter "S" stands for signal. The stronger the received signal the greater the meter reading. Some receivers have conventional analog meters with calibrated scales for this purpose. Other modern receivers use an LED (light-emitting diode) bar-graph type of signal-strength indicator.

The latter units read from left to right, and the greater the signal strength the more LED segments become energized or lit. Some bar-graph displays have yellow, green and red LEDs in combination. Others have only red LEDs.

Are S meters accurate?

We need to shape our thinking in terms of relative meter readings. If an S meter happens to indicate S8 or 10 dB over S9, this does not mean that the signal is really that strong or weak. A standard was set during WW II that called for an S meter to read S9 for a 50-microvolt signal. Each S unit below 9 was supposed to equal 6 dB. In a like manner, readings above S9 were meant to be accurate in accordance with the dB markings, such as 10 or 20 dB. Accurate calibration of this kind is possible if a receiver is a one-frequency or a one-band device. The meter scale is tailor made to work accurately with that particular receiver.

Things become complicated when we attempt to use a given S-meter scale in a multiband receiver. The meter readings seldom track from one band to the next. This is because the overall

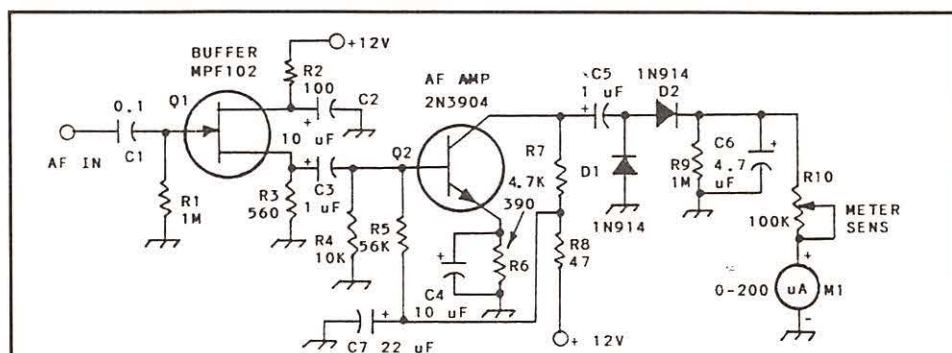


Figure 1: Schematic diagram of the audio-derived S meter. Capacitors are in uF. Polarized capacitors are electrolytic or tantalum. Fixed-value resistors are 1/4 watt. R10 is a PC mount carbon composition trimmer control. Q1 can also be a 2N4416 or other N-channel JFET. Q2 can be a 2N2222, 2N4400 or similar device.

receiver gain or effective gain distribution is different from band to band. It is for this reason that S meters are, at best, relative-reading instruments. In effect, a true S6 signal may read 10 dB over S9, or an actual 20-dB-over-9 signal may read as low as S9.

Accurate measurements can be made, however, if we observe the changes on the S meter when, for example, comparing antennas, and then use a calibrated step attenuator between the antenna and receiver to cause the same change in meter reading. The step attenuator dB steps are used to determine the true change in signal level. Your receiver needs to have provisions for an external antenna if this method is used. Also, the antenna and receiver must present a 50-ohm impedance to the attenuator.

The foregoing discussion should not suggest that S meters are useless. Relative meter readings are very useful for most nonscientific applications. After all, our radio rooms are not electronics laboratories.

This month's project

Figure 1 shows the circuit for our S meter. It is an audio-derived indicator that uses a meter. The S meter in superheterodyne receivers with AGC is operated from the IF (intermediate frequency) amplifier circuit. This is called "RF derived." Since there are no IF amplifiers in a

Note: The S-meter in this project may be used with the Regenerative Receiver built in the January issue.

regenerative or DC receiver circuit, we must sample audio energy, amplify it, rectify it and use the dc voltage to deflect a dc meter or bar-graph indicator.

The sampling point for the meter amplifier must be ahead of the audio-gain control. If we sample audio energy after the gain control we will have problems with the meter reading differently with each setting of the control. In other words, we need a pick-off point that is always the same. A good spot for sampling audio energy is at the output of the detector or directly after the audio preamplifier.

Q1 in Figure 1 is a JFET. It has a high-impedance input characteristic which is dictated by the 1-megohm gate resistor, R1. This arrangement prevents the meter amplifier from loading down the audio circuit at the takeoff point. Q1 is a source follower, which means it has no gain. In fact, the output is 0.9 the input level. Q2 amplifies the sampled audio energy which is rectified by voltage doubler D1 and D2. The resultant dc voltage causes meter M1 to deflect to the right. R10 is used to calibrate the meter. It may be set so that moderately loud signals read S9 or midscale on the meter face.

Capacitor C6 filters the pulsating dc and serves as a charge-discharge network in combination with R9. The greater the C6 capacitance the longer the decay (discharge) time for the meter. Too small a capacitance permits the needle

of the meter to swing rapidly back and forth as the signal strength changes for a voice or CW transmission. Values as great as 22 μF are suggested for C6.

Surplus edgewise FM receiver tuning meters are fine for use at M1 of Figure 1. Any dc meter may be used if the full-scale sensitivity is 100 to 500 μA . You may want to remove the meter face and make a new scale that has S units. If you don't want to buy a meter, you can use your VOM as the S meter. Most volt-ohm-milliammeters have a μA type of meter movement.

LED bar-graph S meter

A kit of parts is available for an LED bar-graph type of S meter, should you prefer this kind of indicator. It is available with a plated and drilled PC board from A&A Engineering, 2521 W. La Palma Blvd., Unit K, Anaheim, CA 92801. The kit is sold as a Visual Voltmeter and sells for \$19.95. The circuit is added to the Figure 1 circuit in place of M1. I have built two of these kits and they work nicely as S meters when set for the 0-5 volt dc range.

Final comments

I hope this article has provided information that will be useful to you when you build receivers. There is no reason why you can't use this circuit also as an RF voltmeter by attaching a probe to C1. If this is done, change C2, C3, C4 and C5 to 0.1 μF .

A drilled and plated PC board for the circuit in Figure 1 is available from FAR Circuits, 18N640 Field Court, Dundee, IL 60118. Price is \$3 plus \$1.50 shipping. Most of the parts for this project may be purchased from Oak Hills Research, 20879 Madison Avenue, Big Rapids, MI 49307. Send \$1 for catalog of electronics parts and QRP CW transmitter kits.

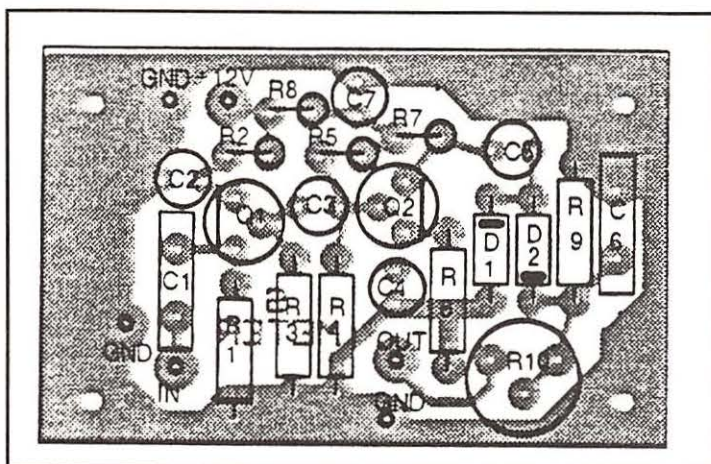


Figure 2 — Enlarged xray view of the S meter PC board as viewed from the component side. This parts-placement template is 1.5 times scale.

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1992: The Year of the Interface

Interface Your Computer to your Scanner

In the era of crystal controlled scanners our fondest dream was to be able to program them like computers. We weren't overly enthused at shelling out five bucks per crystal per channel even though it was the only game in town.

Tennelec was the first to fulfill the dream with the MCP-1. SBE followed with the OptiScan and Regency with the Whamo 10. This early effort soon gave way to a host of PLL-programmable 8 & 10 ch scanners.

Then we dared to dream of more channels; 8, 10, and even 20 weren't enough as memory channels became easily programmable at whim and fancy. Radio Shack responded with the 50-channel PRO-2002 in 1981. This one was overwhelming until fingers acclimated to half-hour programming sessions and our frequency lists inched past 51 and then zoomed into the hundreds.

When the 300-channel PRO-2004, modifiable to 400-ch, was introduced in late 1986, our frequency lists accelerated into the thousands! An unheralded malady surfaced during this period—"keyboard knuckle," similar to tennis elbow. This was caused by three-hour programming sessions four times a week, especially when occasional glitches (or tampering) would wipe out 300 & 400 channels of precious memory in one fell swoop. Most of us came to accept chronic keyboard knuckle syndrome as an inevitable part of life.

Those measly 400-channel allotments were profoundly expanded with memory modifications of up to 25,600 channels. But two very wicked things surfaced in this period: OK, so we got 25,000 channels in our TurboWhopper Scanners; just exactly WHAT were we to do with them? Definitely NOT program them by finger, though one gentleman confides to me that he has filled all but 800 channels in his 6,400 channel PRO-2006!

The other drawback was the grim realization that while maybe a few hundred frequencies could be adequately managed on notebook paper, there was no way several thousand frequencies could be administered in the same way. As early as 1982 I rubbed elbows with this little gremlin when I had a couple dozen different program configurations for my 50-channel PRO-2002.

More recently, my 25,600-channel PRO-2004 sat with 25,400 empty channels after successive memory losses due to my fooling

around in the scanner. I just didn't have any time left for repetitive programming after the several previous intense efforts were nullified. Now, all this has changed.

Innumerable scannists like myself have turned to computers to manage their extensive frequency files. Companies have responded by providing data bases on disk, such as Grove Enterprises has done with their excellent "FCC Database" There are also several data base managers available, such as DataFile, Inc. developed ProScan® to help the scannist manipulate frequency lists. Loosely organized groups of scannists in many communities also trade frequency information by computer disk and via the computer BBS networks.

Now that computers are doing the gruesome, arduous task of record-keeping, the next logical dream is hands-off computer programming of the scanner's memory banks using those massive frequency files as a resource! I pined for an RS-232 Interface in the Wish List section of my first *Scanner Modification Handbook* in 1989. World class receivers such as the Icom R-71A, R-7000, Kenwood R-5000, Yaesu FRG-9600 and others were already interfaceable with computers, but not scanners.... not until now!

It's here, the Year of the Interface! Already several hobbyist-designed scanner/computer interface circuits are floating around and at least two commercial interfaces are available for the PRO-2004, PRO-2005 and PRO-2006. It may be only a matter of time before interfaces are developed for other scanners.

Computers and interfaces are the coming thing for hobby radio and with ample reason. You, the hobbyist or professional, can stay focused on the main event of monitoring those mysterious airwaves with an affordable, powerful receiving system! Almost gone is the energy-sapping drudgery of data entry and management. Press a button or two on your computer and in less than 10 minutes, the scanner can be programmed and operating with 400 channels of your choice to suit the specific interest of the moment: FBI this hour; DEA the next; aviation later; business, police, military, railroads, fire, medical, emergency services, etc, any time your predilection changes!

And this is only the tip of the iceberg of great things in store for you when your scanner is interfaced to a computer! Some interfaces also let you automate operation of the scanner from the computer keyboard as well as facilitate unattended collection of data such as active frequencies, search & store operations,

communications traffic studies and much more!

What is an Interface?

Details vary from one to the next, but a typical scanner/computer interface is just a small circuit board with a few chips and other components. It can go inside the scanner or in a small project box to remain external to the scanner.

One end of the interface will have an input and the other an output. The output has several wires to connect to various points inside the scanner while the input is connected via a cable to the computer. The scanner may have to be modified to accept the interface's output signal wires.

Some interfaces may be very easy to install in the scanner; others could be beyond the beginner's ability. Most are connected to the computer's serial port, serial card, or COM port, although some interfaces are connected to the parallel printer port instead.

Some interfaces work without special software, usually just a standard telecom or terminal program; others may require a specialized stand-alone program. Lots of options and features can be available with the latter while the former may be slightly limited but will be quicker, simpler and easier to operate.

The purpose of an interface is to translate computer commands to the same commands that are generated by the scanner's keyboard when you press its keys. The process is not as hairy as you might imagine, the main variables being how the inputs and outputs are connected and how the computer has to be operated to make the interface work. Generally speaking, none are difficult to operate.

This has been an overview and brief history of the concept of scanner/computer interfaces and of the emergence of computers into the hobby radio scene. I will share with you in the coming months detailed information about do-it-yourself interfaces and those which can be purchased from suppliers. Until then, if you want to assemble more information on this rising star, see the sidebar for points of contact and be prepared to enter a whole new world! Meanwhile, I would like to hear from those who have built scanner/computer interfaces and/or who use computers to make monitoring less of a task and more of a serious pursuit.

PRO-2004/5/6 INTERFACES: HARDWARE & SOFTWARE

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SYSTEMS & SOFTWARE INC.
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When contacting the above companies,
please mention *Monitoring Times* and this
column as your source.

Kenwood R-5000 Expansion Features

The R5000 has some expansion features not documented in the user manuals. These are controlled by diodes on the CPU board, which is on the inside of the receiver's front control panel under a metal RF shield. We will cover one nice feature now and others in subsequent articles.

To access the expansion diodes, remove the top and bottom covers of the receiver via the eight silver screws which hold each cover in place. Remove the four flat silver screws that are under the covers (NOT the black screws that are visible with the covers on) which hold the front panel onto the main chassis. Be sure the receiver is sitting on a solid table so that the front panel will not fall off when you do this.

Carefully pull the front panel forward and lower it to access the back of the front panel. Loosen the five small metal screws (two at the top, three at the bottom) which hold the RF shield in place over the CPU board. The holes in the shield are slots, which allow it to be slipped off without removing the screws completely.

Locate the row of eight small, vertically-mounted option diodes on the CPU board. They are labelled D65 through D72, and are located near and perpendicular to six-pin inline connectors 54 and 55, and parallel to the eight-pin connector 53.

"Memory Search" Feature:

This is perhaps the best of the known options. Diode D-69 is present in stock receivers to disable the memory search feature. Clip or remove D-69. Reassemble the covers and screws in reverse order from above. Press the orange M.IN key for selection of memory you want to store a frequency in, and the silver "1MHz DOWN/UP" buttons on the front panel will allow you to step through the UNUSED memory channels. This lets you select a memory without having to step through all the used ones.

The front panel knob still scans the whole set of memories, so you don't lose any functions when this feature is enabled. Also, when you are in the memory mode (i.e., the mode in which M.CH is indicated on the display) and not storing into memory (normal operating mode), the Down/Up buttons step through the set of USED memories, skipping the empty ones.

Since I mentioned "some expansion features" at the beginning of this section, you may be tempted to start whacking & chopping other diodes. Don't, if you know what's good for you! Some "expanded features" are better left unexpanded, and others are of dubious value. We'll explore them soon.

Meanwhile, please keep your mods, tricks, hints & kinks pouring in; we'll publish the better ones with credit to the submitter!

73/bc

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A Really Small Outdoor Antenna

Many of us fantasize, from time to time, about the monitoring that we could do with some super-antenna such as an all-band beam atop a 100 ft. tower. Of course, in reality, few of us even remotely approach that goal. But we usually do try to optimize our listening fun with the best antenna that we can put up. For many *Monitoring Times* readers with restricted space available, a small antenna is the only realistic solution to getting in on the action. But fortunately, as we've pointed out many times in this column, using small antennas can still get you in on most of the action if you do it right!

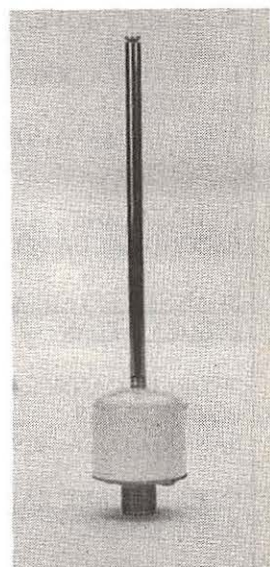
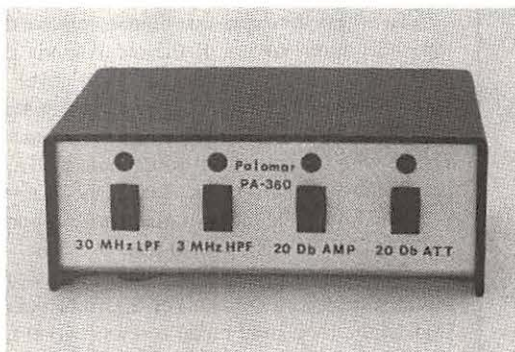
This month, we review the Palomar Engineers "Super-Snooper SWL Antenna," a short collapsible whip antenna with a special matching network built in to its base to allow its use from .5 to 30 MHz. We will also review another Palomar antenna-accessory product, the "Amplifilter," which may be used to improve antenna performance with many receivers.

The Super Snooper

The first sentence in the Palomar Engineer's catalog description of this antenna reads: "The best antenna is a full size outdoor antenna." I respect the manufacturer for making this statement. If you have the space for a larger outdoor antenna, this is not the antenna for you.

But if your space is limited, this short whip will get you "on the air." The Super-Snooper is designed to be located outside your home as far as possible from the noise field generated by your household electrical appliances. A coaxial cable carries the antenna's output back to your receiver. By locating the whip outside the noise field you should find that the signals you monitor have less noise interference and are more readable than would be true with the antenna located in the house. This noise reduction feature can be very important at many locations, so don't fail to consider it in relation to your own needs.

The antenna with its telescoping whip fully extended is 36 inches, which is small enough that you can probably find a place for it if you are going to find a space for any antenna at all. There is a small (1 5/8 in. diameter) case at the bottom of the whip which protects a network that matches the antenna to its coax feedline. The antenna can be used with up to 200 ft. of coax if necessary, and it comes with a mounting bracket.



For its size, the Super Snooper gives good performance. Add the Amplifilter and it compares favorably with a long-wave antenna.

Goodbye IMD

Although the Super-Snooper's signal output is much less than you get from an active antenna, it does have one advantage over active antennas which will appeal to many readers. Due to the fact that there are no active components in the passive matching-network at the whip's base, the antenna generates no intermodulation distortion (IMD) on excessively strong signals.

IMD, often produced in active antennas by strong local signals, prevents many monitoring enthusiasts from being able to use an active antenna. This IMD-free feature of the Super-Snooper, coupled with the gain which can be added by use of the Amplifilter as discussed below, makes the Super-Snooper a good choice over an active antenna for many monitoring locations bothered by excessive IMD.

Using the Super Snooper

The antenna performed essentially as claimed by its manufacturer. I was able to receive signals across its entire frequency range of .5 to 30 MHz. The level of signal output from the whip was definitely much less than that from my long wire antenna, and I am sure it would also be less compared to other longer antennas such as a halfwave dipole. A number of signals that were readable but not loud from the long wire were absent in the whip's output.

And that is just what is to be expected with a very small antenna used without a preamplifier. For its size, it gives a good performance. If you have space to put up a larger antenna, choose that option over the Super-Snooper. If you are

limited to antennas the size of the Super-Snooper, then this whip antenna with its matching network is a good choice.

Adding An Amplifier

The Amplifilter signal preamplifier, manufactured by Palomar Engineers, is an obvious ideal companion to the Super-Snooper whip antenna.

The Amplifilter functions over the broad frequency range of .1 to 1000 MHz. It has four panel switches which insert or remove the following functions from its circuits: a 20 dB amplifier which helps bring up weak signals if they aren't imbedded in too much noise, a 20 dB attenuator which can help reduce IMD at times, a low-pass filter which essentially eliminates any signals above 30 MHz (VHF and UHF TV, FM, utilities, etc.) to prevent strong signals in those bands from causing IMD, and a 3 MHz high-pass filter which greatly attenuates signals below 3 MHz (particularly strong local broadcast stations) to prevent their causing IMD problems.

These switched functions can be used in any combination. With all switches switched "off" the Amplifilter is completely out of the circuit, and the performance of any antenna connected to it is unaffected by the Amplifilter.

The most obvious advantage to pairing the whip with the Amplifilter is that the whip's low signal output can be amplified 20 dB. This makes a significant difference on some signals, and less on others. If the signal is already at listenable levels with the whip alone, there is little or no

advantage to switching in the Amplifier's 20 dB of gain. On the other hand, signals that with the whip alone are weak and unreadable, but not too noisy, can often be brought up to readable levels with the amplifier added. In my test, using the Amplifier's 20 dB gain with the Super-Snooper led to a signal output which compared favorably with my long wire antenna.

The Amplifier can be used with random length antennas, and also I suspect with just about any antenna. Its SO-239 accommodates coaxial cable and the unit can also be used with single-wire or twinlead feedline. A 12-18 volt power supply, available separately from the manufacturer, is required for use of the 20 dB amplification function of this unit.

Both the Super-Snooper and the Amplifier are available from Palomar Engineers, P.O. Box 455MT, Escondido, CA, 92033. My recent catalog lists the Super-Snooper at \$39.95, the Amplifier at \$79.95, and the power supply for the Amplifier at \$9.95. There is a \$4.00 shipping and handling charge per order

January Correction

In last month's column, the formula for cutting the length of elements in our multi-band sloper antenna was incorrect. Rather than 468, the formula should read as follows:

$$\text{Length}_{(\text{in feet})} = 234 / \text{Frequency}_{(\text{in kHz})}$$

RADIO RIDDLES

Last Month:

I told you how *Monitoring Times* reader Paul M. Lalli, AA5AN, had riddled the old riddler himself. His riddle for me was "What is a unipole antenna?"

Good riddle, Paul! "Unipole antenna" is another name for the isotropic antenna or isotropic radiator, a theoretically conceived antenna which radiates equally in all directions. But, unfortunately, the unipole exists in theory only, and does not exist in the real world of antennas. So we won't likely be talking about how to build one in this column.

Next Month:

So we won't ever write about how you can build yourself a unipole antenna — who cares? We can still write about how you can build your own monopole antenna, which sounds like the same thing. Or does it? Or can we?

Find the answer to that and much more in the next issue of *Monitoring Times*. 'Til then, Peace, DX, and 73.

mt

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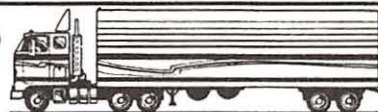
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The Computer Connection

There is so much that can be done with a computer to enhance your monitoring hobby. Receiver control, creation of frequency data bases, decoding digital modes, automatic hunting for new frequencies, unattended tuning and recording — the possibilities are growing every day.

In order to perform most of these functions what computer system is required? There is little question that although many excellent computer systems are available from Apple, Commodore, Atari and others, by sheer number of units in the field, the IBM PC clone is the winner. You will also need to decide what external devices you want your computer to control, because this will determine which printed circuit "cards" you have installed in your PC.

The need for controlling and communicating between pieces of electronic equipment was recognized in the late sixties/early seventies. After many years of company lobbying, two standards eventually emerged; the serial and the parallel input/output (I/O) ports. As the name suggests, in the serial the information is sent down the wire in freight train fashion, one piece of data following another in single file. In the other case the data is broken into binary coded decimal form. Then each "digit" is fed down a fixed standard number of wires, going to their destination in parallel.

Each method has its unique advantages and disadvantages. Most printers use the parallel port for communications with the computer. Devices such as modems (a device which converts data into tones and allows communications over telephones) use the faster serial port.

In the past few years manufacturers of terminal decoding units and receivers have been moving to serial data for the control and communication of their equipment. Unfortunately, when the standards for the serial interface were being established, microprocessor-controlled receivers did not exist. The serial bus, designed to control industrial and telecommunications devices over long distances, tolerates higher voltage levels and wider swings than the microprocessor controlled receivers which are based on 5 volts. Therefore, a serial to 5 volt interface, like ICOM's CT-17, is usually required to go between the computer's serial port and the receiver.

How many of each kind of port are the ideal for communications control? To be able to produce a hard copy of our files a parallel port for a printer will be necessary. If we just want to do some receiver controlling one serial port is required. However, if decoding of digital signals such as RTTY or ARQ is part of our listening hobby, then a second serial port is needed for a decoding terminal unit such as an AEA PK-232.

Check the manual which came with your PC. If you have two serial ports called COM 1 and COM 2 you're on your way. If not, you will need to upgrade your I/O card.

OK, almost there. Now that we have two serial ports, COM 1 and COM 2, the receiver/scanner can be connected via the required serial-to-5 volt interface to COM 2, and the terminal unit to COM 1. Finally, remembering the freight train analogy for the serial port, we have to make sure that the "speed limits" of those trains coming and going to the receiver and computer are equal so the "switchmen" can handle the traffic. The serial port speed limit is called the Baud rate, and it is determined by the receiver/terminal unit design. See your receiver and software owner's manuals for the recommended Baud rate settings.

In the start-up, or system configuration screen, of most control and decode software packages you must tell the software which COM port your receiver and terminal unit is connected to and the Baud rates for each. And now you can use the full potential of software such as Scorpio, which we will now review.

SCORPIO: Shortwave Computer Operated Radio Plus I/O

Ashton ITC has designed SCORPIO to be a total listening environment; there is no need to leave the SCORPIO program once you begin monitoring. Receiver control, display of terminal unit decoding, scanning and modifying previous log files, creating new log files and tracking QSL response: this is today's total monitoring environment (a similar philosophy to J&J Enterprises' Scancat program reviewed last month). With the power available in today's PCs, the direction of the future is toward constantly adding more functions and speed to this environment.

For the price of \$89.95 plus shipping and handling, you get SCORPIO on a 3-1/2 or 5-1/4 inch disk and a one hundred or so page manual. The manual gives very clear instructions for the connection of receivers and terminal units. Also software settings, such as baud rate and COM port connections are suggested.

The minimum computer requirements to use all of SCORPIO's features are: an IBM PC/XT/AT/PS-2 or 100% compatible clone, 256K of RAM memory, a Hercules/CGA/EGA/VGA monitor, two floppy drives and two serial ports (one for receiver control and the other for the digital decoding terminal - sound familiar?). A hard disk and a mouse are recommended by Ashton. After using the program for a number of days, I would raise the hard disk to a necessity.

More on the mouse later.

There are so many receivers that SCORPIO can control that Ashton just lists the manufacturers: all ICOM radios having a CI-V control port, all Kenwood radios having an IF-232c control port, all computer ported Ten-Tec radios and the receiver sections of Yaesu 757 MKII and 767 transceivers. Once again, a serial to 5 volt interface, such as the ICOM CT-17, is required in most cases and is available from the radio manufacturer.

When SCORPIO is typed at the DOS prompt, the screen presents the operator with a start-up menu with a number of items. The basic ones are: the ports where the receiver and terminal unit are connected, the name of the logbook file you would like to start with, the name of the memory file you would like to store new data in and the date and time, automatically read from the system's clock.

Once the set-up information is correct, two presses of the Enter key brings up the main display screen. This screen is horizontally divided into four functional sections. The top section, the logbook/status window, displays the current receiver settings of frequency and mode, plus the station details—such as ID/location/agency/remarks/data—of the entries in the current log. An indication of the operator's choice of radio functions and logging operations available are displayed and can be controlled with a mouse from this top section. The very bottom section of the screen indicates the actions taken by the press of a function key; for example, changing the log file.

These two sections comprise the operator control console of SCORPIO. The two middle sections of the screen are where decoded information from the terminal control unit (TU) is displayed and operator instructions to the TU are typed.

To operate, a log file is first loaded. Then the operator can decide to have the receiver scan the whole file or just scan log entries which match a set "key." This key can be any data stored in the ten or more station detail fields displayed in the top section of the screen. For example, USCG (U.S. Coast Guard) can be entered in the ID field. SCORPIO then tells you how many matches it found in the current file, in this case how many USCG entries it found. Through a series of mouse clicks or keyboard commands the receiver is made to tune to the frequencies and modes of the matches.

Of course the whole log file can be easily scanned, but one of many "tricks" explained in the manual must be used. A very powerful feature of SCORPIO is how it can set the terminal unit to the correct decode mode if this info is included

in the station entry information. It is impressive to watch SCORPIO scan through a list, changing mode as necessary, see the receiver follow, and have continuously decoded information automatically appear in center of the screen. This is the closest to hands-off operating I have seen in a non-military produced program.

Comments and Other Features, Real and Imagined:

SCORPIO also includes a very powerful logging section. A feature not commonly found is SCORPIO's ability to read manual changes made to the receiver by the operator and display them on the screen. For example, when manually tuning around for stations, once one of interest is found, the computer can automatically record the new frequency or mode. This makes logging very quick.

This program can do an awful lot, but this is a double-edged sword. After hours of working with SCORPIO the manual is still a real necessity. Screen prompt abbreviations in the top section are not easily understood. Although there is a line of function key actions, quite a number of individual key strokes, which are not clearly indicated on the screen, are required for important operations. Some of this confusion can be avoided by the use of a mouse. In fact, it appears that the program's designers considered the mouse to be the primary command method when they designed SCORPIO.

However, mice (mouses!) come in at least two different types: Bus version or the serial port version. Yup! If the quite popular serial port mouse is used, there goes SCORPIO's total monitoring environment; the terminal unit must be disconnected. Not a good trade-off.

In many ways the user-friendliness (ergonomics) of SCORPIO does not keep pace with the excellent technical features, resulting in a long learning curve. For the experienced, diligent computer/radio operator this is not a major problem. But for the beginner it may be a bit overwhelming.

The scanning feature's minimum pause per entry is three seconds, which is too long. This may be a limitation of the hardware, but even using the arrow keys you can manually scan faster. This three second linger limits the usefulness of the scan function.

As far as features that could be added, one major one comes to mind: the addition of a signal detect function so that true scanning and untended listening can be achieved.

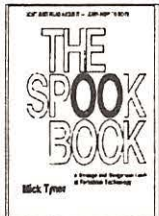
Ashton deserves credit for their forward thinking in the technical concept of SCORPIO. At \$89.95, plus shipping and handling, SCORPIO is available from Ashton ITC, P.O. Box 830-MT, Dandridge, TN 37725. Telephone (615) 397-0742. Fax (615) 397-0466.

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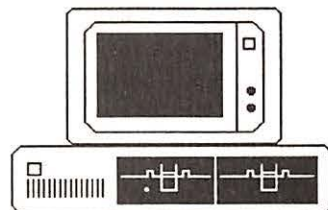
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Reader's Feedback

Do you have a question, problem or just plain scared about using your computer in the radio shack? Maybe you are not alone. How about a favorite piece of radio-related software that you find indispensable? Let me know so we can tell the rest of the listening world about it. 'Til next month, stay warm and don't forget your serial!



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Q. What is meant by "narrowband technology" for the new 220-222 MHz band?

A. Virtually all VHF/UHF land mobile services use narrowband FM which occupies approximately 16 kHz worth of spectrum for each signal; narrowband technology refers to a system that occupies substantially less space.

For all practical purposes, narrowband technology (5 kHz bandwidth or less) refers to single sideband (SSB), and there are three types presently under development for land mobile applications:

(1) Amplitude-compandered sideband (ACSB) which transmits a single 3.5 kHz tone above the sideband ("tone above band"--TAB) permits a convenient reference for the receiver to lock onto.

(2) Real zero single sideband (RZSSB) includes a reduced carrier for the receiver's reference, which is then amplified and demodulated with a technology similar to FM.

(3) Transparent tone in band (TTIB) places an audible tone in the center of the SSB signal for the receiver's reference, but it is notched out by a filter so that it isn't heard.

Q. When an airline goes out of business, what happens to their frequency assignments?

A. The Federal Aviation Administration (FAA) is assigned most of the 118-137 MHz range, but 128.825-132.0 MHz is licensed to Aeronautical Radio Incorporated (ARINC) who, in turn, authorizes specific frequencies to the airlines and corporate jets.

If an airline goes under, its frequencies simply rejoin the pool and may be reassigned at ARINC's discretion.

Q. Would it be possible to determine all the base frequencies of your local cell site by repeatedly dialing it up on a cellular phone and watching a frequency counter display the output frequencies of your cell phone? (Joseph Bial, Chagrin Falls, OH)

A. Yes. The cell site will always transmit exactly 45 MHz higher than your cell phone, and will adjust your phone's frequencies to accommodate the loading of the cell at that particular time.

Q. I recently bought a Grove ANT-6 "Hidden Antenna"; are there any hints for installation? (Robin Hartford, Newburyport, MA)

A. The Grove Hidden Antenna is a flexible, indoor antenna made primarily for improved scanner reception when compared to the original attachable whip (it can also be used for shortwave reception if attached to a preamplifier like the Grove TUN-4 amplified preselector).

Scanner antennas should always be mounted vertically, away from large masses of metal or wiring, and as high as practical. The Hidden Antenna is a vertical dipole consisting of a four-foot upper element and an 18" lower braided wire; these should be pulled straight away from each other when pinned to a drape or tacked to a wall.

When used for shortwave reception only, the Hidden Antenna may be mounted horizontally or vertically since shortwave signals are of mixed polarization. The 18" braid is not functional in that range and may be taped back against the coax or even cut off.

Q. Do LCD computer screens emit less radio frequency interference (RFI) than cathode ray tube (CRT) types? Are the newer "RFI-limiting" screens quieter? (Judson Hamblett, Yaounde, Cameroon)

A. Yes. Yes.

Q. How can I charge my Uniden BC200XLT scanner from the cigarette lighter in my old White truck which has positive ground? (Ronny Holmes, Fort Fairfield, ME)

A. Since your truck is wired just the opposite of modern vehicles, you will have to be sure that the center hole in the small end of the charger cord is connected to the outside spring contacts of the cigarette lighter plug.

If you aren't sure, test it by attaching a voltmeter between the center hole and barrel of the small plug after inserting the cigarette-lighter end into the dash receptacle. The center hole should read positive (+) and the outer barrel negative (-). If not, cut the wires, connect them in reverse and tape the splices well.

This same procedure can be used for most any 12-volt operated equipment in the older positive-ground vehicles; just be sure that no metal parts of the equipment touch the metal of

the vehicle while the cigarette lighter plug is inserted into the dash! This includes external antennas which touch the vehicle body.

It is important to use a fused cord to prevent fire in case of an accidental short.

Q. Reception on my portable shortwave receiver is unstable using its whip in my upstairs apartment. Will a better antenna solve my problem? Must I purchase an expensive preselector, preamplifier and antenna? (Harlan Zimmerman, Philadelphia, PA)

A. A good antenna makes a big difference on any radio. But on inexpensive portable shortwave sets, the signal capturing ability of a large antenna can overload the receiver, as characterized by a constant din of annoying background signals all over the band.

This intermodulation ("intermod") may be reduced or in some cases eliminated by connecting a tunable preselector between the antenna and the external antenna connector on the portable radio. A preselector is like a frequency "gate," adjusted to pass a narrow swath of frequencies.

Never use an untuned preamplifier (broadband "booster") on a shortwave set when connected to a long antenna (25 feet or more); the overload will make listening worse even though signals are stronger.

Q. I have read that there is a new tracking device that can be attached to criminals so that they can be monitored when they are outside of prison. How do they work?

A. The Traktek from BI Limited (Scottsdale, AZ) is an ankle collar which transmits its digital information in the 303 or 900 MHz range for distances of up to 150 feet for remote monitoring. This distance is adjustable to accommodate the allowable area in an offender's home confinement.

It has a tamper-proof band and is waterproof so it can be worn at all times. The internal battery lasts up to three years, depending upon the transmit interval (which may be as frequent as ten second intervals to prevent unauthorized "leave").

The remote sensing monitor has 13 hour battery backup in case of power failure and may hold and time-record up to 750 events such as leaves, enters, tampers and power disconnects.

Both the offender's ankle transmitter and remote monitoring unit may be reprogrammed by an officer's drive-by when he is using an optional "Autolog" device.

Connected to phone lines (including cellular systems for tracking offenders on the move), BI's Traktek comes with computer software for tracking up to 100 individuals.

Q. My Sangean ATS803A performs well for its price class, but it reads 2 kHz high; can this be easily adjusted? (Chris Cummings, England)

A. I'm afraid not. You will have to take the set back to your dealer or send it to an authorized Sangean service center for realignment.

Questions or tips sent to "Ask Bob", c/o MT, are printed in this column as space permits. If you desire a prompt personal reply, mail your question along with a self-addressed stamped envelope (no telephone calls, please) in care of MT.

Bob's Tips of the Month

CB Tone Squelch

In an earlier column, a reader was looking for a tone alerting page system for his CB radio so that he wouldn't have to listen to the background din while awaiting a call. We didn't know of any.

A letter from Robert Bellville (P.O. Box 515, Millbury, MA 01527-0515) introduced us to a product he makes on special order. His "Tone Call" requires no modification to the CB set, although there is an internally-mountable model available should the customer prefer it (this would, however, void the radio's type acceptance). We know nothing about the product or its manufacturer, so readers are on their own.

For commercial (non-CB) applications, C. Brown of Savannah, Georgia, suggests that two-way users contact Necode Electronics (Rt. 8, Box 575, Livingston, TX 77351); their model 321 AR is designed for marine radio, but could be adapted for other services as well.

When wired into the transceiver, the Necode unit can sound an alarm, will register the code number of the unit calling, and will even send back an acknowledgement to the calling station.

Poor Battery Fit in the Sony ICF-2010

A constant source of irritation among owners of the Sony ICF-2010 shortwave portable is the cantankerous, ill-fitting battery compartment. Not all D-size cells make good electrical contact; Mallory copper-top batteries are particularly troublesome.

One simple fix is to put a small metal washer between the positive (+) contact and the tip of the first battery. Norris Howard of New Lebanon, New York, suggests first removing the sponge rubber from the compartment door, then inserting a quarter (or other coinage) between the number one and number two cells to force a better fit against the contacts.

Norris quips the radio works a bit—maybe two bits—better with that fix!

SCORPIO

ID[Sta]: GKY6 (PORTISHEAD RADIO) Location: England
Date: 02-27-91 Begin Prg: 03:17:35 End Prg: Freq: 17.220.00
Mode: PSK Signal: Agt/Svc: Coastal (sea) QSL:
Remarks: SITOR traffic -<arg>-
Data: 23> / > / 17.220.00 PSK / Signal() 12082
[Radio] [PSE] [CLS] Terminal Mode [CHG] [CLD] [Sr/F] [Qu/Ex]
-LogScan-----Log of John Doe-----[T.J]

CMD: AL
MODE NOW ALIST
.. THIS IS AN AUTO TELEX MESSAGE SYSTEM
TRAFFIC FOR THE FOLLOWING VESSELS:
USS FREDRICKS
HMS UINC...
GA *7

<arg FILE LOADED>

1 Manual 2 Func1 3 Func2 4 Func3 5 Upload 6 TimeON 7 TimeOFF 8 Clear 9 Log 10 Optins

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Club Circuit

Don't see your club listed below? Write the Club Circuit and request a listing form.

ANARC (Association of North American Radio Clubs) has a new president and address; please address inquiries to ANARC c/o Richard D'Angelo, 2216 Burkey Drive, Wyomissing, Pennsylvania 19610.

Club Profiles

Association of Manitoba DXers (AMANDX)

AMANDX members have been trading information and helping each other out with all-band listening since they began meeting in 1986. They have no publication, but monthly meetings are held at a member's home and

average 10-15 in attendance. The date and place varies, so call Shawn Axelrod for up-to-date scheduling. AMANDX also holds an annual DXpedition. The membership fee is only \$2.

North American Shortwave Association (NASWA)

NASWA is the oldest shortwave broadcast club, celebrating its 25th anniversary in 1991. Its membership is worldwide, although its focus is on North American listeners. Their *Journal* (formerly *FRENDX*) is a 68 page monthly bulletin with regular columns on all aspects of shortwave listening, contesting, and QSLing.

NASWA can facilitate local gatherings of its members by doing a computer search of its membership. Three such

affiliates are currently active. The Philadelphia Area Chapter meets on the third Friday of each month (Contact Dan Cashin 215-446-7831). The Boston Area Chapter (also on third Fridays) and Northeast Ohio SWLs (third Tuesdays) are included in the listings below.

NASWA also participates as a sponsor in the Winter SWL Festival, this year to be held March 13-15 at the Holiday Inn in Kulpville, PA (near Philadelphia). For info send an SASE to Winter SWL Fest, P.O. Box 591, Colmar, PA 18915.

Dues are \$25/year and \$25-30 International, depending on location. Sample copies of *The Journal* are \$2.

Club Name: All Ohio Scanner Club

Contact: Dave Marshall
Club Address: 50 Villa Road
Springfield, OH 45503-1036
Region: Ohio and surrounding states
Interests: VHF/UHF and some HF and amateur coverage
Publication: American Scannergram

Club Name: American SW Listener's Club

Contact: Stewart MacKenzie, WDX6AA
Club Address: 16182 Ballad Lane
Huntington Beach, CA 92649
Phone: (714) 846-1685
Region: Western US, Pacific, Asia, & Middle East
Interests: SWBC
Publication: SWL

Club Name: Association of Clandestine Enthusiasts (A.C.E.)

Contact: Kirk Baxter
Club Address: P.O. Box 11201
Shawnee Mission, KS 66207
Region: US, some Europe and Middle East
Interests: Pirate and clandestine
Publication: The A.C.E.

Club Name: Association of DX Reporters (ADXR)

Contact: Reuben Dagold
Club Address: 7008 Plymouth Rd.
Baltimore, MD 21208
Region: International
Interests: Utilities, ham band, QSLing, MW, LW, and SWBC
Publication: DX Reporter

Club Name: Association of Manitoba DX'ers (AMANDX)

Contact: Shawn Axelrod
Club Address: 30 Becontree Bay
Winnipeg, Manitoba, R2N 2X9
Canada
Phone: (204) 253-8644
Region: Manitoba
Interests: LW, MW, SW, and VHF/UHF

Club Name: Bay Area Scanner Enthusiasts

Contact: Herman Frisch
Club Address: 1465 Portobello Drive
San Jose, CA 95118
Region: San Francisco Bay area
Interests: 30+ MHz
Publication: Listening Post

Club Name: Bearcat Radio Club

Contact: Larry Miller
Club Address: Box 360
Wagontown, PA 19376
Phone: 1-800-423-1331
Region: US and Canada
Interests: Scanning only
Publication: National Scanning Report

Club Name: Boston Area DXers

Contact: Paul Graveline
Club Address: 9 Stirling Street
Andover, MA 01810
Phone: (508) 470-1971
Region: 50 mile radius Boston
Interests: SWBC

Club Name: Canadian Int'l DX Club

Contact: Sheldon Harvey, President
Club Address: 79 Kipps St., Greenfield Pk.,
Quebec, Canada J4V 3B1
Phone: (514) 462-1459
Region: Canada nationwide/membership open to all
Interests: General coverage
Publication: The Messenger

Club Name: Cincinnati Area Monitoring Exchange (MONIX)

Contact: John Vodenik
Phone: (513) 398-5968
Region: SE Indiana, Kentucky, SW Ohio
Interests: SWBC, utility, military, satellites, scanning, BCB

Club Name: Drake SPR-4 International Club

Contact: Rick Sitz
Club Address: 5210 14th St. West, #11
Bradenton, FL 34207
Region: International
Interests: Information specific to Drake SPR-4 radio

Club Name: DX Club of India

Contact: Navin Patel
Club Address: 809, M.G. Road, 1-Dutt Niwas
Mulund, Bombay-400 080, India
Region: India
Interests: SW DXing

Club Name: Metro Radio System

Contact: Julian Olansky
Club Address: P.O. Box 26
Newton Highlands, MA 02161
Phone: (617) 969-3000
Region: New England states
Interests: Public Safety
Publication: M.R.S. Newsletter

Club Name: Michigan Area Radio Enthusiasts

Contact: Bob Walker
Club Address: P.O. Box 311
Wixom, MI 48393
Region: Michigan & surrounding
Interests: All bands
Publication: Great Lakes Monitor

Club Name: Monitor Communications Group

Contact: Louis Campagna, Operations Mgr.
Club Address: 8001 Castor Avenue, #143
Philadelphia, PA 19152-2701
Region: 35 mile radius of Philadelphia
Interests: Various types of communications

Club Name: National Radio Club

Contact: Paul Swearingen, Publisher
Club Address: P.O. Box 5711
Topeka, KS 66605-0711
Region: Worldwide
Interests: AM/FM
Publications: DX News 30 times yearly
Sample for a 29 cent stamp

Club Name: North American SW Assoc.

Contact: Bob Brown, Executive Director
Club Address: 45 Wildflower Lane
Levittown, PA 19057
Region: Worldwide
Interests: Shortwave broadcast only
Publication: The Journal

Club Name: Northeast Ohio DXers

Contact: Mike Fanderys
Club Address: 2802 North Avenue
Parma, OH 44134
Phone: (216) 661-2443
Region: NE Ohio
Interests: SWBC and utilities

Club Name: NE Ohio SW Listeners

Contact: Brian Schaft
Club Address: 317 South Rocky River Dr.
Berea, OH 44017
Phone: (216) 234-4628
Region: NE Ohio
Interests: SWBC

Club Name: Northeast Scanner Club

Contact: Les Mattson
Club Address: P.O. Box 62
Gibbstown, NJ 08027
Phone: (609) 423-1603 evenings
Region: Maine thru Virginia
Interests: UHF/VHF, public safety, aircraft, military
Publication: Northeast Scanning News (NESN)

Club Name: Ontario DX Association

Contact: Harold Sellers, General Mgr.
Club Address: P.O. Box 161, Station A
Willowdale, Ontario M2N 5S8
Canada
Phone: (416) 853-3169 voice & fax
(416) 299-6392 DX-Change information svce.
Region: Predominantly Providence of Ontario
Interests: SWBC, utility, MW, FM-TV, scanning, technical, propagation
Publication: DX Ontario

Club Name: Pakistan SW Listeners Clubs Association

Contact: Javid Iqbal
Club Address: P.O. Box 5
Sheikhupura, 39350, Pakistan
Region: Pakistan
Interests: SWBC

Club Name: Regional Communications Network (RCN)

Contact: Bill Morris, Public Info. Officer
Club Address: Box 83-M
Carlstadt, NJ 07072-0083
Region: 50 mile radius of NY City
Interests: HF, VHF, UHF, 800 MHz, utilities, and broadcast

Club Name: Rocky Mountain Radio Listeners

Contact: Wayne Heinen
Club Address: 4131 S. Andes Way
Aurora, CO 80013-3831
Region: Colorado Front Range
Interests: All bands
Publications: Annual meeting calendar for an SASE

Club Name: Southern California Area DXers (S.C.A.D.S.)

Contact: Don R. Schmidt
Club Address: 3809 Rose Avenue
Long Beach, CA 90807-4334
Phone: (310) 424-4634
Region: California area
Interests: AM, FM, TV, scanner and shortwave broadcasting

Club Name: SPEEDX (Society to Preserve the Engrossing Enjoyment of DXing)

Contact: Bob Thunberg, Business Mgr.
Club Address: P.O. Box 196
DuBois, PA 15801-0196
Region: Worldwide
Interests: SWBC, utilities
Publication: SPEEDX-monthly newsletter

Club Name: Toledo Area Radio Enthusiasts

Contact: Ernie Dellinger, N8PFA
Club Address: 6629 Sue Lane
Maumee, OH 43537
Phone: (419) 865-4284
Region: NW Ohio and SE Michigan
Interests: Shortwave, scanning, amateur

Let's Start A Club:

Joseph Czarniecki
968 Buckwalter Rd.
Lititz, PA 17543-9249
Interested in SW & scanning

Alan Grick
P.O. Box 23, Prospect St.
Montrose, PA 18801
Interested in scanning

SPECIAL EVENT CALENDAR

Date	Location	Club/Contact Person
Feb 8	Blain, MN	Midwinter Madness Hobby Electronics Show/Robbinsdale ARC P.O. Box 22613, Robbinsdale, MN 55422
Feb 8-9	Miami, FL	Southern Florida Section Convention/Evelyn Gauzens, W4WYR 2780 NW 3rd St., Miami, FL 33125
Feb 14-16	Sarasota, FL	Sarasota Amateur Radio Assoc./William Eddie Martin, K14ZJ 1870 Bahia Vista St., Sarasota, FL
Feb 15	Pensacola, FL	1992 Pensacola Hamfest/Bill Behrends, Jr., WA4YRN 1050 W. Carlton Road, Pensacola, FL 32534 (904) 476-8537 Location: Bayfront Auditorium, admission \$3, talk-in on 146.16/.76.
Feb 19	Toronto, Ont.	Ontario DX Association Monthly Meeting Location: North York Central Library, Room #2 5120 Yonge Street, Toronto; 7-10 PM.
Feb 22	Milton, VT	Northern Vermont Winter Hamfest/ Mitch Stern, WB2JSJ (802) 879-6589 Location: Milton High School, RT 7, 8AM to 3PM, admission \$2 Talk-in on 145.47/600
Feb 22-23	Cincinnati, OH	Ohio State Convention/Stan Cohen, WD8QDQ 2301 Royal Oak Court, Cincinnati, OH 45237
Feb 23	Dearborn, MI	Livonia Amateur Radio Club/Neil Coffin, WA8GWL 35681 Hees, Livonia, MI 48150
Feb 29	Orange, TX	Orange Amateur Radio Club Hamfest/Sherwood Buckalew, KA5VOT (409) 883-6111 or Dan Killough, WB4GYS (409) 769-8436. Location: VFW Hall on Hiway 87 one mile north of IH 10.
Feb 29	Lebanon, PA	AARG Hamfest/Ron, W3HNX (717) 345-8667 Location: Lebanon Fairgrounds, 8AM until ?, admission \$4. Talk-in on 146.04/.64
Mar 1	Yonkers, NY	WECA Fest '92/Sarah Wilson, N2EYX 3478 Russel Pl., Yorktown HTS, NY 10598, (914)962-7279 Location: Yonkers Raceway, 9AM-2PM, \$5 admission.
Mar 1	York, PA	Keystone ARC, et.al. Hamfest/John Shaffer, W3SST 2596 Church Road, York, PA 17404
Mar 7	Absecon, NJ	Shore Points ARC/SPARC P.O. Box 142, Absecon, NJ 08201 Location: Holy Spirit H.S., RT 9, approx 1/2 mile south of RT 30. \$4 admission. Talk-in: 146.385/985.
Mar 7	Cave City, KY	Mammoth Cave ARC Hamfest/Larry Brumett, KN4IV, 108 Withers St., Glasgow, KY 42141
Mar 10-16	Flemington, NJ	OSCAR DXpedition/contact Jim Kelly, KK3K, (215)978-5272 or Flemington Hamfest/Marty Grozinski, NS2K c/o CRA II Inc., P.O. Box 308, Quakertown, NJ 08868, (908)806-6944 Location: Hunterdon Center Regional HS Field House, RT 31 & 523 8AM to 2PM, \$5 admission, talk-in on 147.375+ Don Bledsoe, WB6LYI, (310) 494-6765.
Mar 15	Maumee, OH	Toledo Mobile Radio Assoc./Chuck Krukowski 9408 Salisbury, Monclova, OH 43542
Mar 22	Jefferson, WI	Tri-County ARC/TCARC, W9MQB, 213 Frederick, Fort Atkinson, WI 53538. Location: Jefferson County Fairgrounds, Hwy 18 West

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FREE CATALOG: Scanner and shortwave books and accessories. Firecom, P.O. Box 61-MT, New York, NY 10011. Write or call (212) 989-5773.

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WANTED: Grove Scanner Beam ANT-1, Grove Wideband Pre-Amplifier PRE-4 and PRE-3 Power Ant; Grove MiniTuner TUN-3. Write or call: J.L. Courtney, P.O. Box 98; Lemmon, SD 57638, phone (605) 374-5944.

ICOM IC-R1 handheld scanner with high capacity snap on battery, new in box \$425; GROVE CVR-1 Scanverter, converts signals in 216-420 MHz range to standard scanner/shortwave ranges \$25; 10 years of Monitoring Times, Jan 1982-Dec 1991, 108 issues, only 3 missing, \$60 obo. Call Marty (908) 735-0777.

SONY ICF-SW1, two years old, kit is complete, works well. Call Phil (603) 224-2170 for price.

AEA PX232MBX with current hardware and software plus two power supplies and manuals \$250; YAESU YO301 monitor scope, excellent \$150. Fred Nagle (914) 234-9692 7-10pm EST.

ICOM R71A, passband tuning, ESKAB synchronous detector and 4 kHz crystal filter, CR-64, RC-11, EX-257, EX-309, EX-310, CK-70, SP-3, IRI 2.1 kHz filter, service manual. Immaculate. I ship \$1100. John (410) 247-4712.

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SONY ICF-SW77 World band receiver, 162 memories, SSB. Almost new. \$415; SONY ICF-SW7600 World band receiver, compact model, SSB, \$160. Mint. (401) 568-2152 6PM EST Bill.

FOR SALE: INFOTECH M-200F \$125; M-600 \$275; AEA PK-88 \$80; KANTRONICS KAM \$200; AEA PK232-MBX \$210; Mint TEN-TEC Corsair II w/pwr supply, VFO, Filters, mic \$1400. Todd, KM4IC (919) 851-8586.

FOR SALE: ICOM R71A mint condition, with FL44A and FL63A filters. Also IC-SP3 speaker, passband tuning, and manual, \$650. Joe (407) 331-5982.

Need operating/technical manual for DAK Mark IX radiotelephone. Will pay. P.N. Davis, 143 Bluewater Lane, Cahokia, IL 62206.

GRUNDIG Satellit 500, 1 month old, mint, \$425 w/ shipping. Claude (516) 484-4218, 8-10 pm EST.

FOR SALE: ICOM R71A, includes EEB 19" rack kit, CW filter options and FM demod. Asking \$650; ICOM R7000, includes EEB 19" rack kit, TV video/audio demod option. Asking \$700; UNIVERSAL M-7000 includes rack ears, V2.0 with FAX option. Asking \$800. Contact Dave (513) 738-2147.

FOR SALE OR TRADE: HALLICRAFTERS Continental, S-38DM, S-94, S-95, SX-62A; NATIONAL NC-60 special; KNIGHT Star Roamer; DRAKE SPR-4, R-4C; Want electric trains or transceiver covering 10 meters. William R. Smith, 56 Locust St., Douglas, MA 01516.

ICOMR1 \$350; SONY PRO-80 \$275. Both hardly used, in original boxes. Call Kevin, early evenings, (612) 729-5598.

AR-900 Scanner, 100 channels w/cellular, mint, first \$165. Keith (407) 260-8392.

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The Selling of the Spectrum

Money, not merit, talks in Washington. In the last decade, the 11 top Political Action Committees (PACs) contributed \$50 million to 92% of the members of the House of Representatives in an effort to earn their favors. One could logically deduce that our tax dollars are providing salaries for some of the highest-paid prostitutes in the country.

In the anything-for-a-buck Capitol Hill climate, there are plans to sell our radio spectrum — an endangered natural resource — to the highest bidder, rather than award licenses to applicants who offer the most beneficial use to the public in general.

At present, the Department of Commerce estimates that cellular telephone frequencies alone are worth up to \$80 billion; a 200 megahertz swath presently being reclaimed from the federal government could be sold to commercial users for more than \$200 billion; such an auction is being vigorously supported by the Bush administration.

The British magazine, *The Economist* (June 8, 1991), raised three arguments against auctions: “first, the government cannot sell what it does not own; second, auctions might fend off deserving newcomers offering new services; third, they would prevent the government fulfilling its primary duty, of ensuring the airwaves are reserved for the uses that are in the public interest.”

But then *The Economist* errs in assuming that only those American businesses with the greatest need for new frequencies would have the most money to bid.

During the last decade, financial speculators applied for licenses with no intent to use them; one speculator alone sold his license for more than \$40 million. Does this represent the public interest? Hardly!

The *Economist* says that anti-trust legislation would prevent monopolization of the airwaves, naively overlooking the fact that we are talking about the same legislators who are peddling their influence to the lobbyists.

When the 220-222 MHz amateur radio spectrum was reallocated, tens of thousands of license applications came in — many generated by the same application mills that promote speculation as an investment opportunity.

If the Federal Communications Commission cannot award licenses to the most deserving applicants, then perhaps a lottery is the only solution.

But *Monitoring Times* strongly opposes selling the spectrum to the highest bidder. Such capitalistic largess will exclude the small, emerging competitors who may better represent emerging, spectrum-efficient technologies, the future of radio communications.

Bob Grove
Publisher



Tune in that signal with the Grove MiniTuner or MiniTuner Plus!

MiniTuner Plus



Grove has taken two of our most popular products, the MiniTuner and preamplifier, and combined them into one powerful, frequency-adjustable signal booster for short-wave listeners. Use it with a short indoor or outdoor antenna and watch those signals explode!

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Better than any active antenna on the market, the MiniTuner Plus allows you to customize your listening requirements. You can use it as an amplified or unamplified tuneable preselector, all with fingertip control!

But its features don't end there. You can also select between two antennas, connect two separate receivers to either antenna, and even remove the TUN4 from the antenna circuit, all at the touch of a switch!

Tune in that weak station, switch on the low-noise, high-gain transistor amplifier, then peak the tuning control for an astounding improvement in signal strength! Equipped with 3' PL259 coax cable. 12 VDC power supply and full instructions included.

Order TUN4 *only* **\$139⁹⁵**

\$4 UPS; \$6 Parcel Post; \$12 Canadian Air Parcel Post

ACCESSORIES:

CKSW accessory kit **\$12.95** (includes 20' antenna wire, banana plug, 3 adaptors, for all portable and multiband tabletop radios equipped for external antenna connections).

ANT6 Hidden Antenna **\$19.95** (see pg. 30)

SPECIFICATIONS

Gain: Approximately 20 dB

Frequency Range: 100 kHz-30MHz in four bands

Preselector Type: Series-tuned L-section filter

Power Required: 9 to 18 volts DC (12 VDC nom.) @ 30 mA

Connectors: SO239 (4) signal line, 2.1 mm DIN power

Cabinet: Custom formed aluminum, baked enamel finish

Dimensions: 9-1/4"W x 3"H x 4"D

Weight: 1-1/2 lbs.

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SPECIFICATIONS

Frequency Range: 100 kHz-30 MHz in 4 bands

Circuit: Series-tuned L-section filter

Tuner: 365 pF air variable capacitor, ball bearing drive

Input connector: SO-239 (UHF, female) with random wire provision

Output connector: PL-259 (UHF, male) on 24" coax cable

Enclosure: Custom formed aluminum

Dimensions: 4"W x 2"H x 3"D

Weight: 12 ounces



The TUN3 is unnecessary for shortwave reception on more expensive receivers like the ICOM, JRC, Drake, and Kenwood R5000, but it will eliminate overload problems like intermodulation and desensitization on all economy radios equipped with an external antenna jack like Sony, Panasonic, Radio Shack, and Philips/ Magnavox.

It will also improve low frequency reception on all receivers in the 100-540 kHz range where broadcast band interference is so common. Simply connect the MiniTuner between the antenna cable and your receiver and adjust the dial for peak reception of your favorite station!

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